US007458488B2

(12) **United States Patent**
**Bass et al.**

(10) **Patent No.: US 7,458,488 B2**
(45) **Date of Patent: Dec. 2, 2008**

(54) **PORTABLE CARRYING DEVICE WITH RETRACTABLE STRAP**

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( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/649,437**

(22) Filed: **Jan. 3, 2007**

(65) **Prior Publication Data**

US 2007/0108241 A1 May 17, 2007

**Related U.S. Application Data**

(63) Continuation of application No. 10/652,455, filed on Aug. 29, 2003, now abandoned.

(51) **Int. Cl.**
***B65H 75/40*** (2006.01)

(52) **U.S. Cl.** ..... **224/162**; 224/600; 224/268; 224/269

(58) **Field of Classification Search** ..... 224/917.5, 224/162, 159, 268, 269, 600; 150/108; 190/108
See application file for complete search history.

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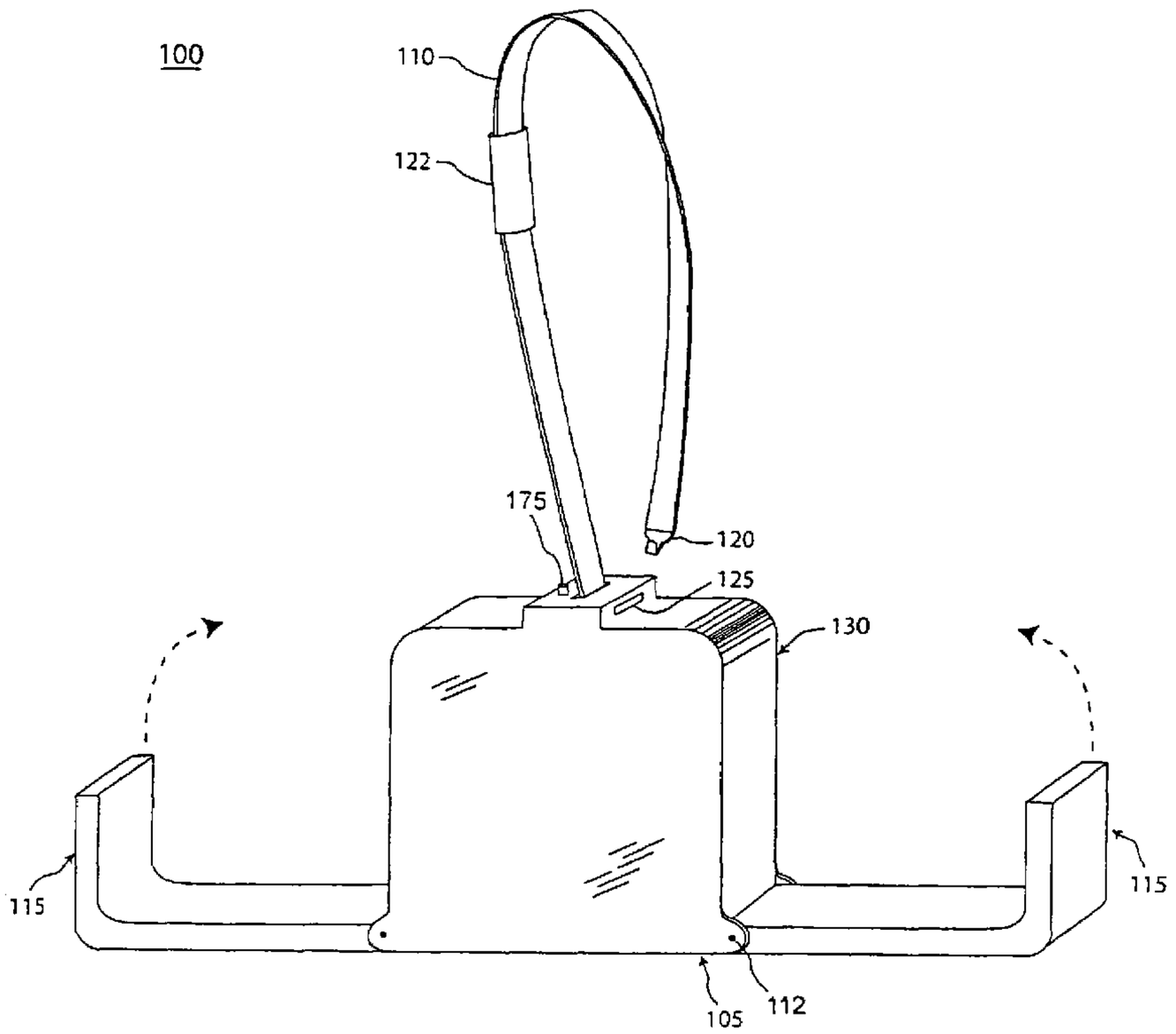
(57) **ABSTRACT**

The invention is directed to a portable carrying device that includes a housing, an elongated flexible strap extendable from the housing, and at least one rigid support arm attached to the housing and configured for supporting an article to be carried. The portable carrying device can include a coupler disposed on a first end of the elongated flexible strap and a mating structure disposed on a portion of the housing for releasably securing the coupler. The rigid support arm can be movable from a first position in which the rigid support arm is compactly stored relative to the housing, to a second position in which the rigid support arm is at least partially extended away from the housing. The housing can have at least one recess for receiving the rigid support arm and the rigid support arm can have a shape corresponding to the recess.

**11 Claims, 12 Drawing Sheets**



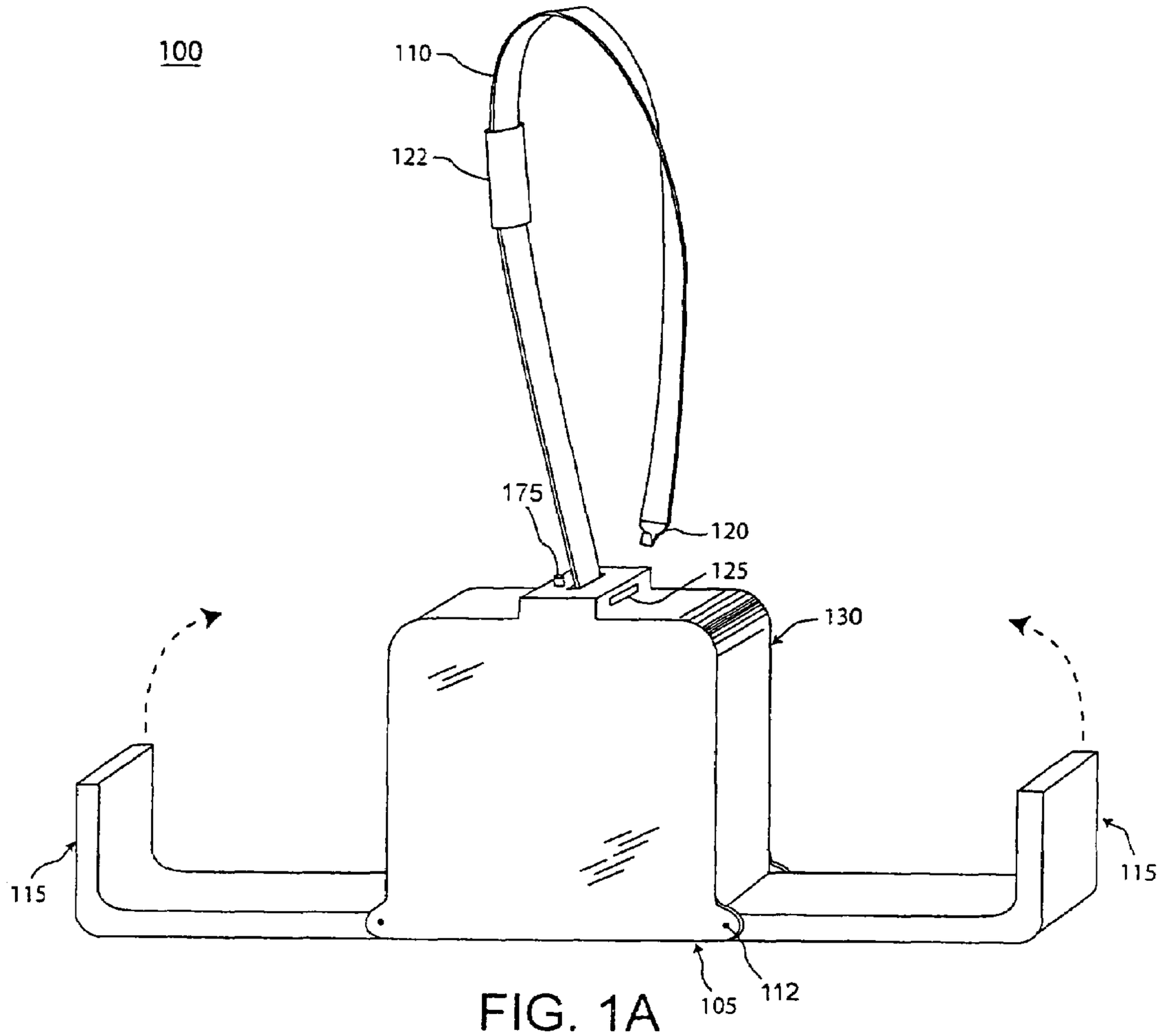



FIG. 1A

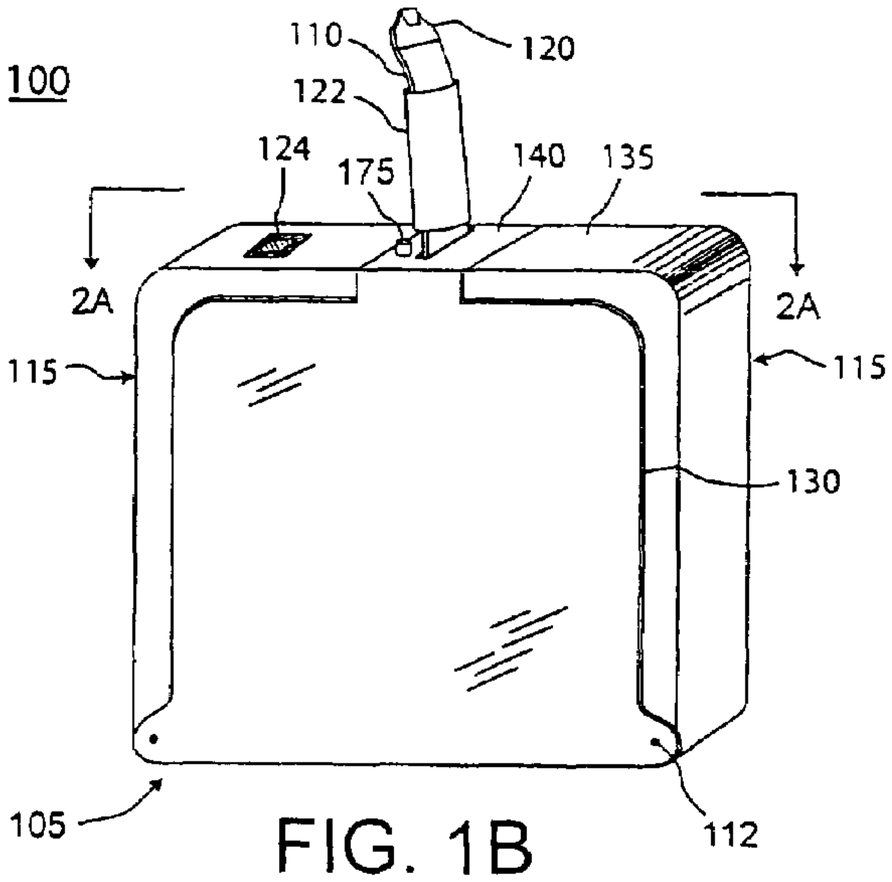



FIG. 1B

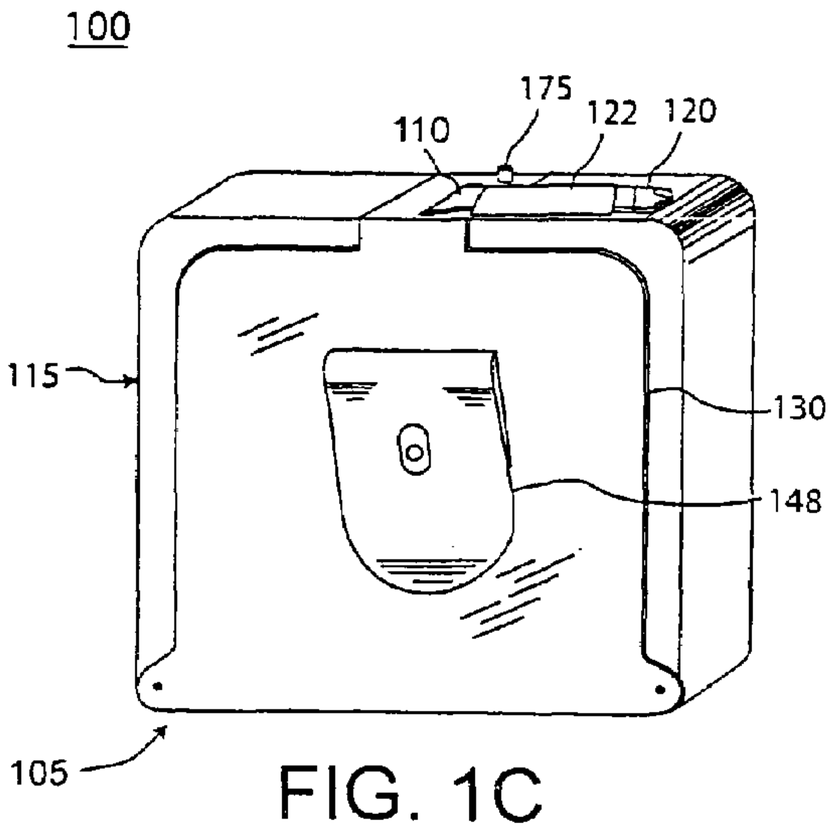



FIG. 1C

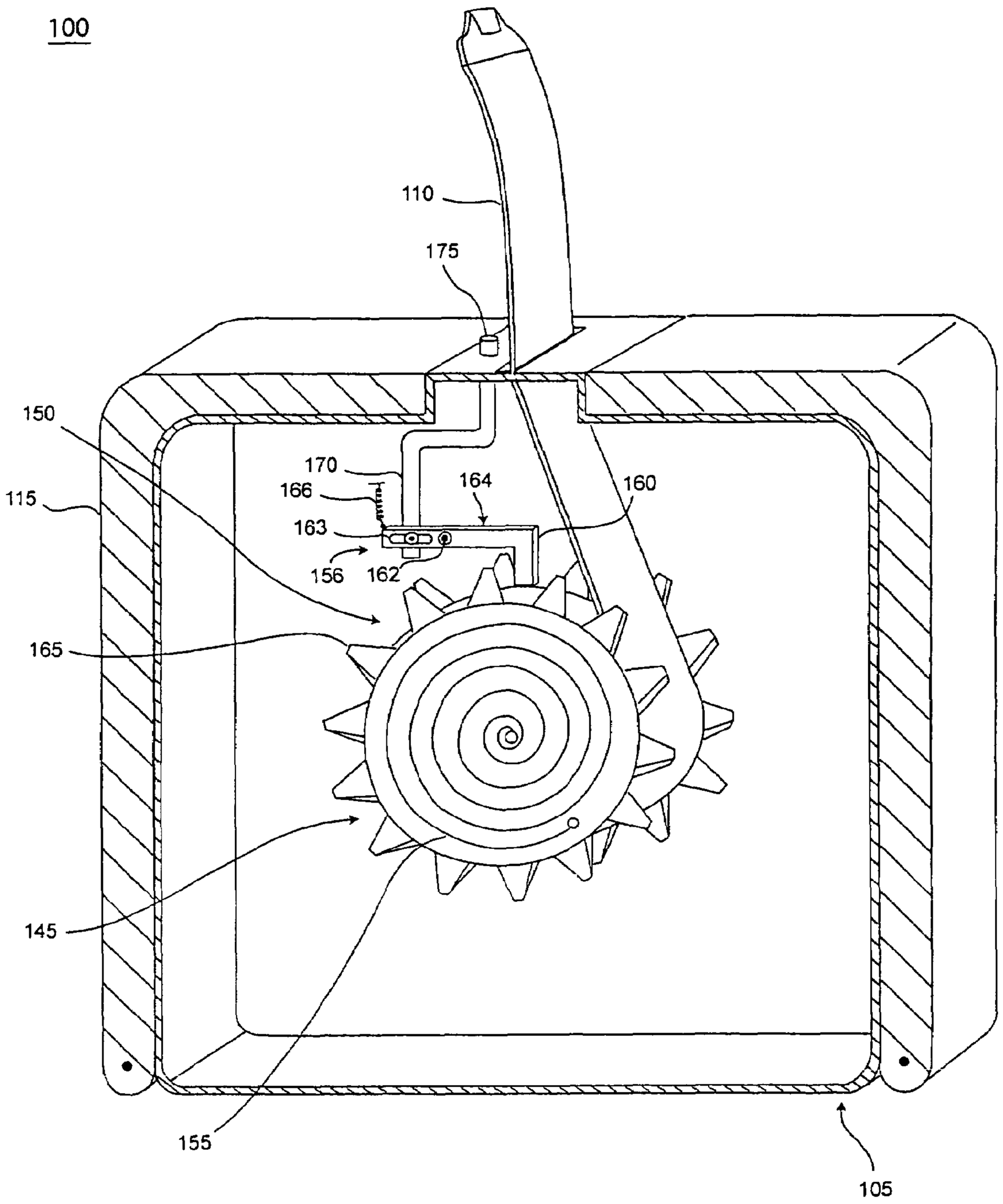



FIG. 2A

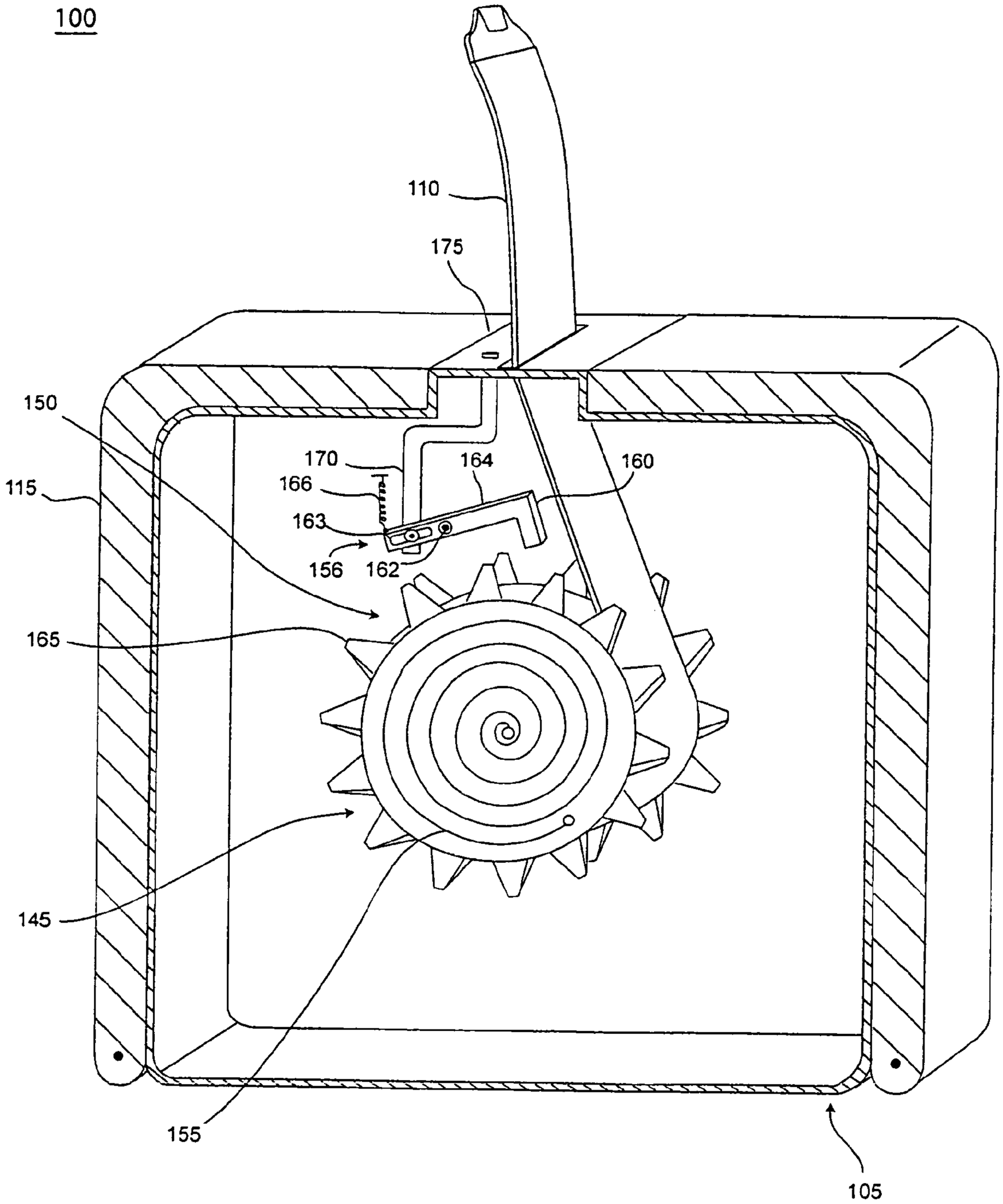



FIG. 2B

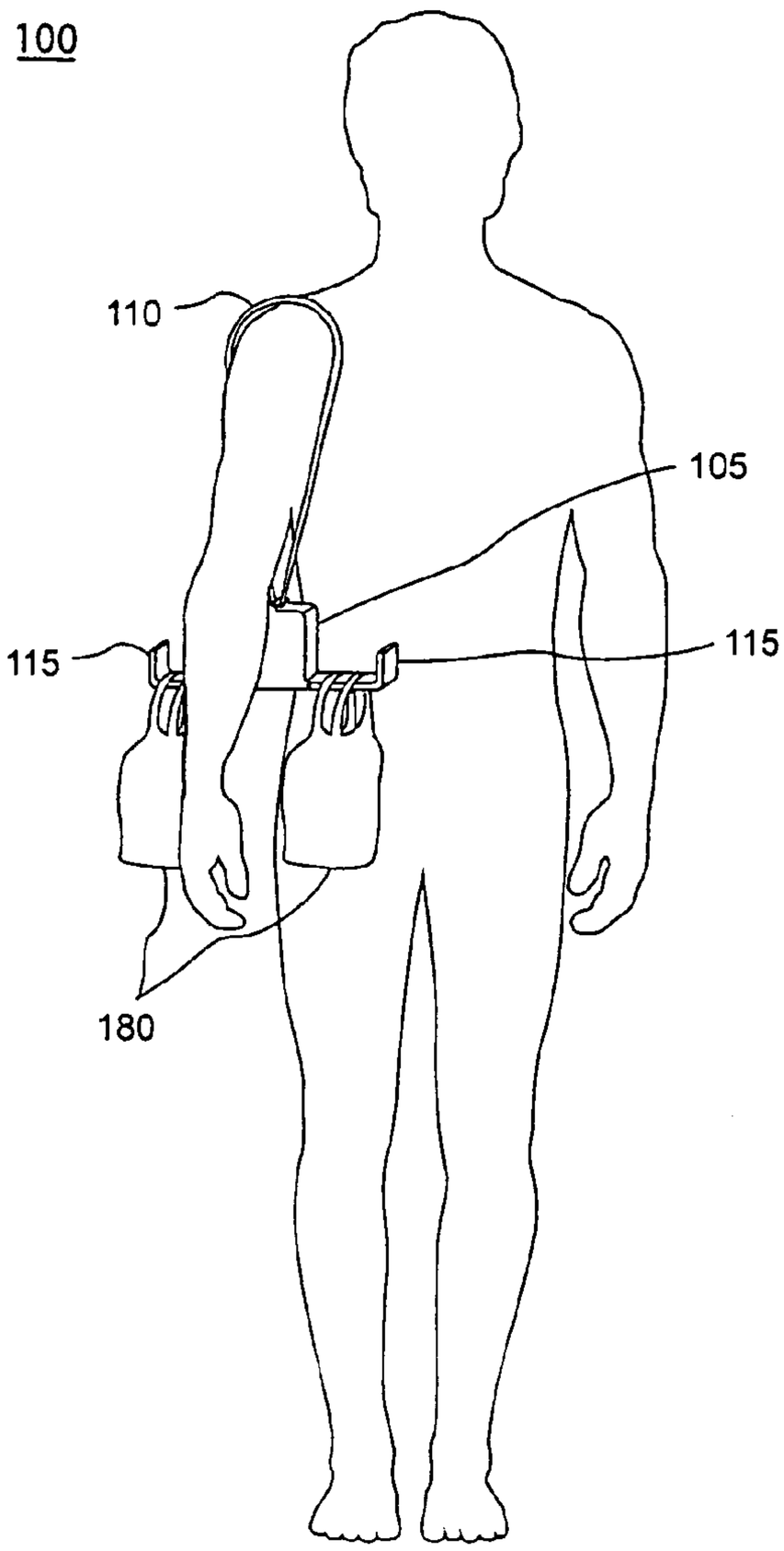



FIG. 3A

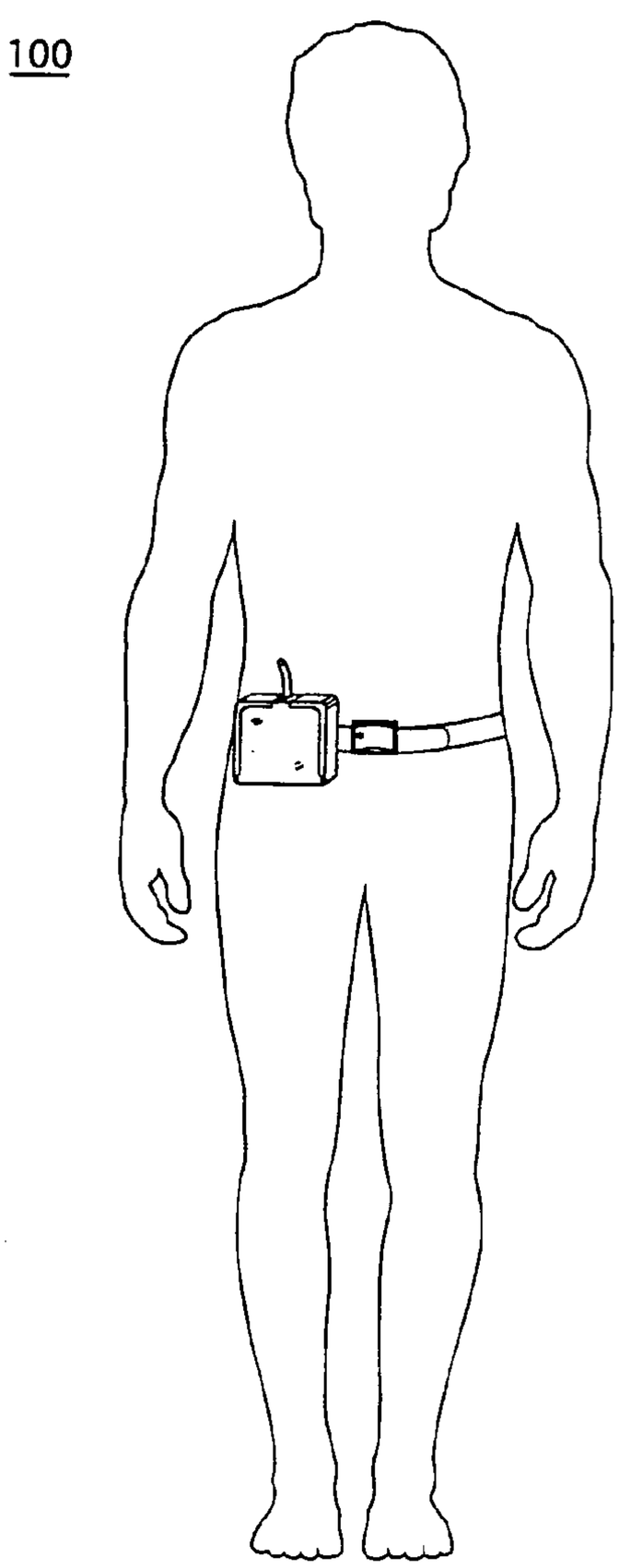



FIG. 3B

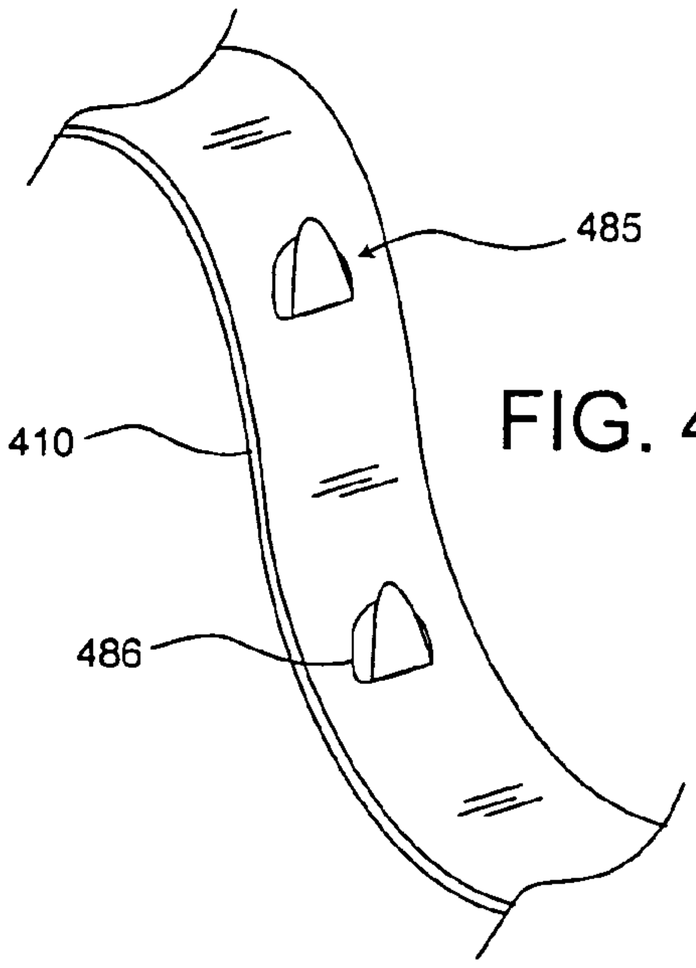



FIG. 4A

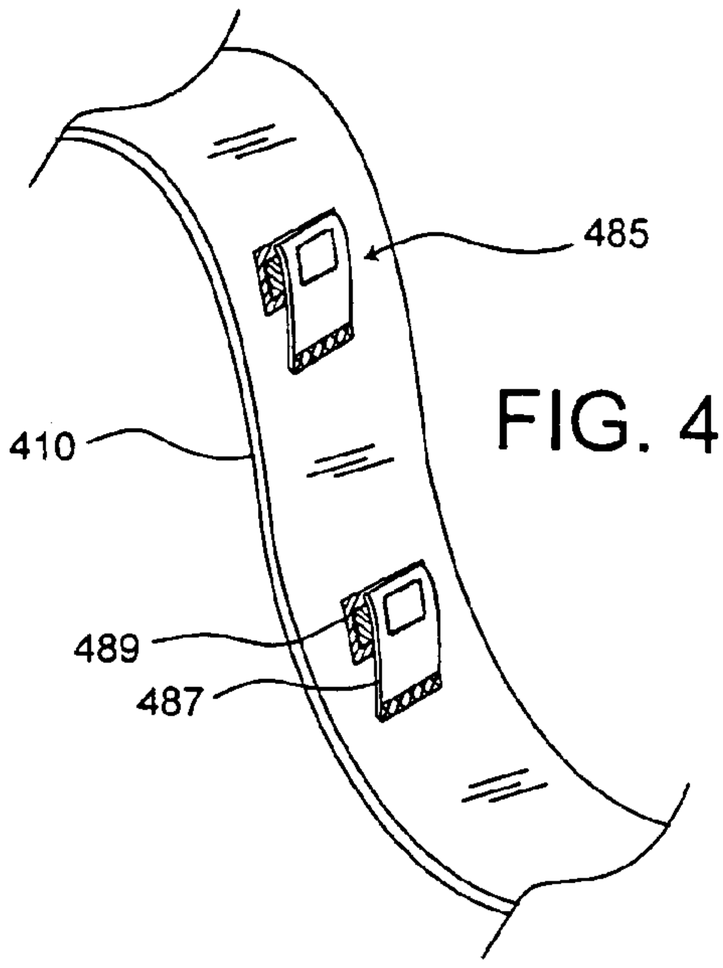



FIG. 4B

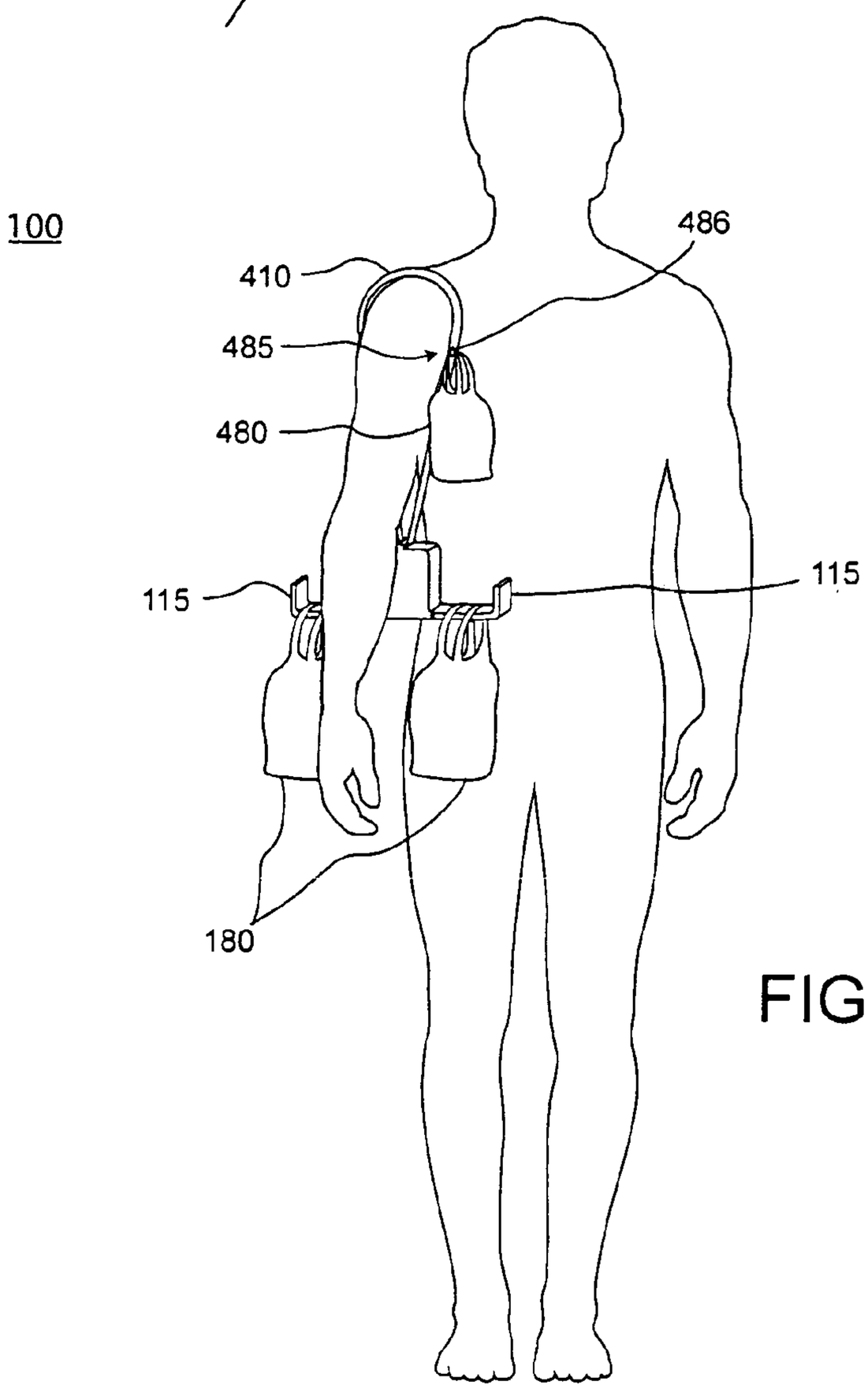



FIG. 4C

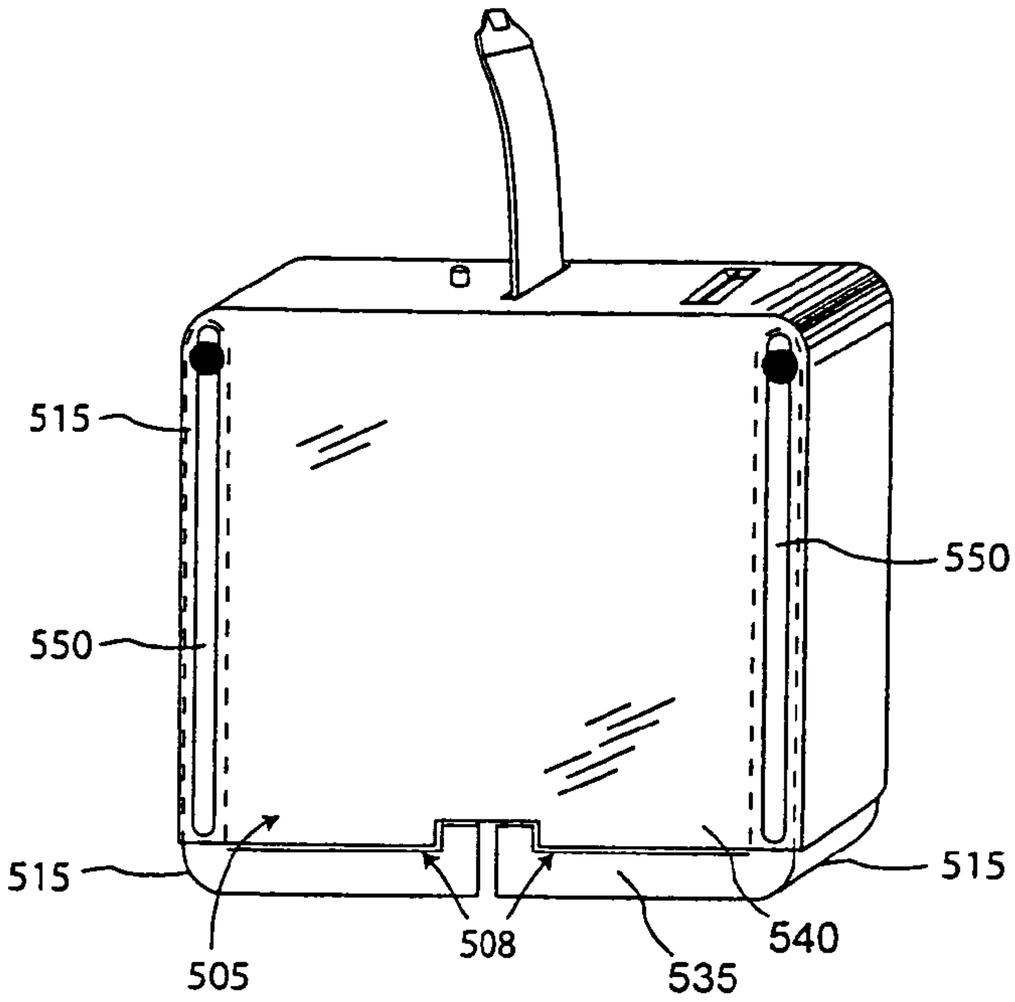

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FIG. 5A

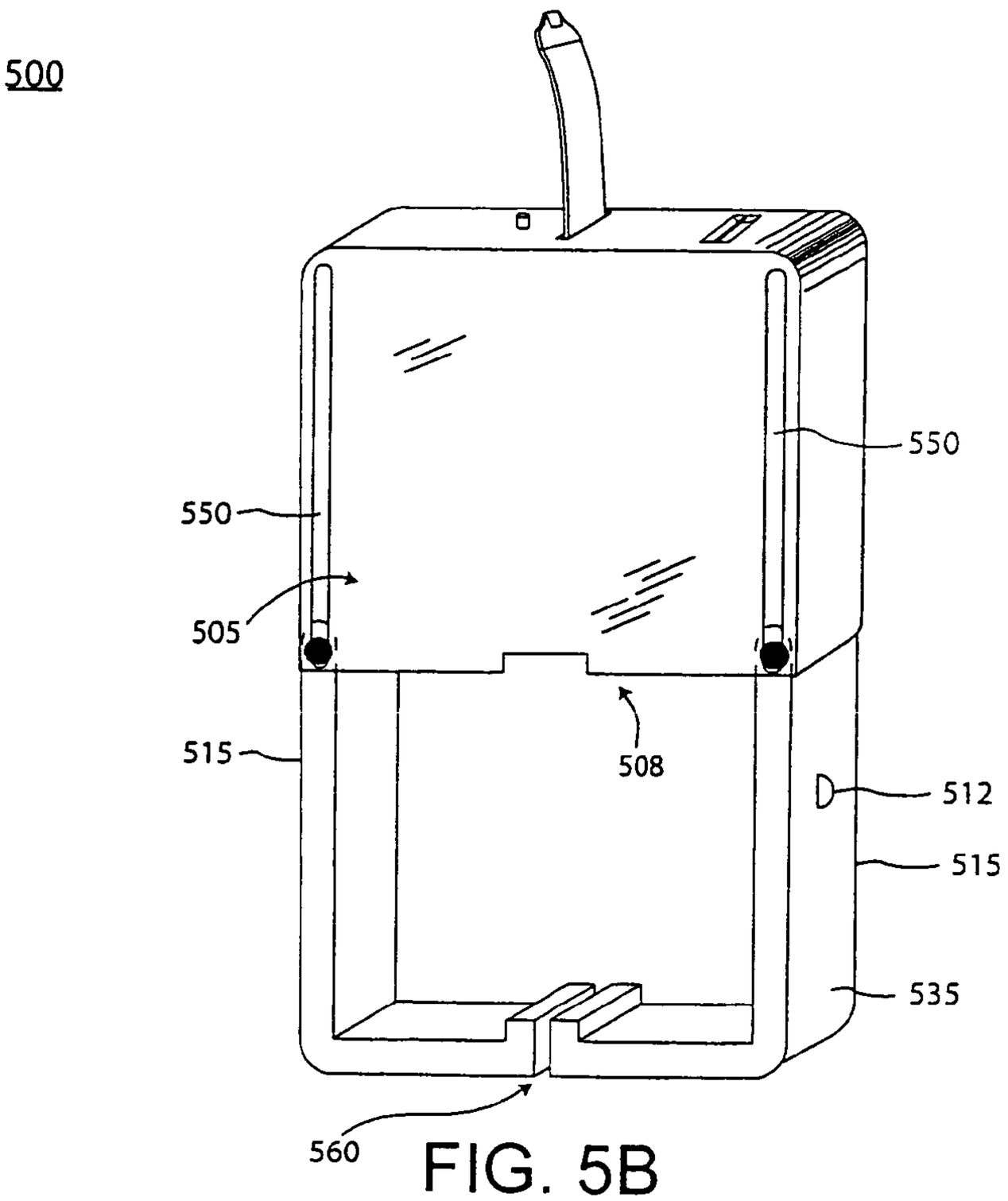
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FIG. 5B

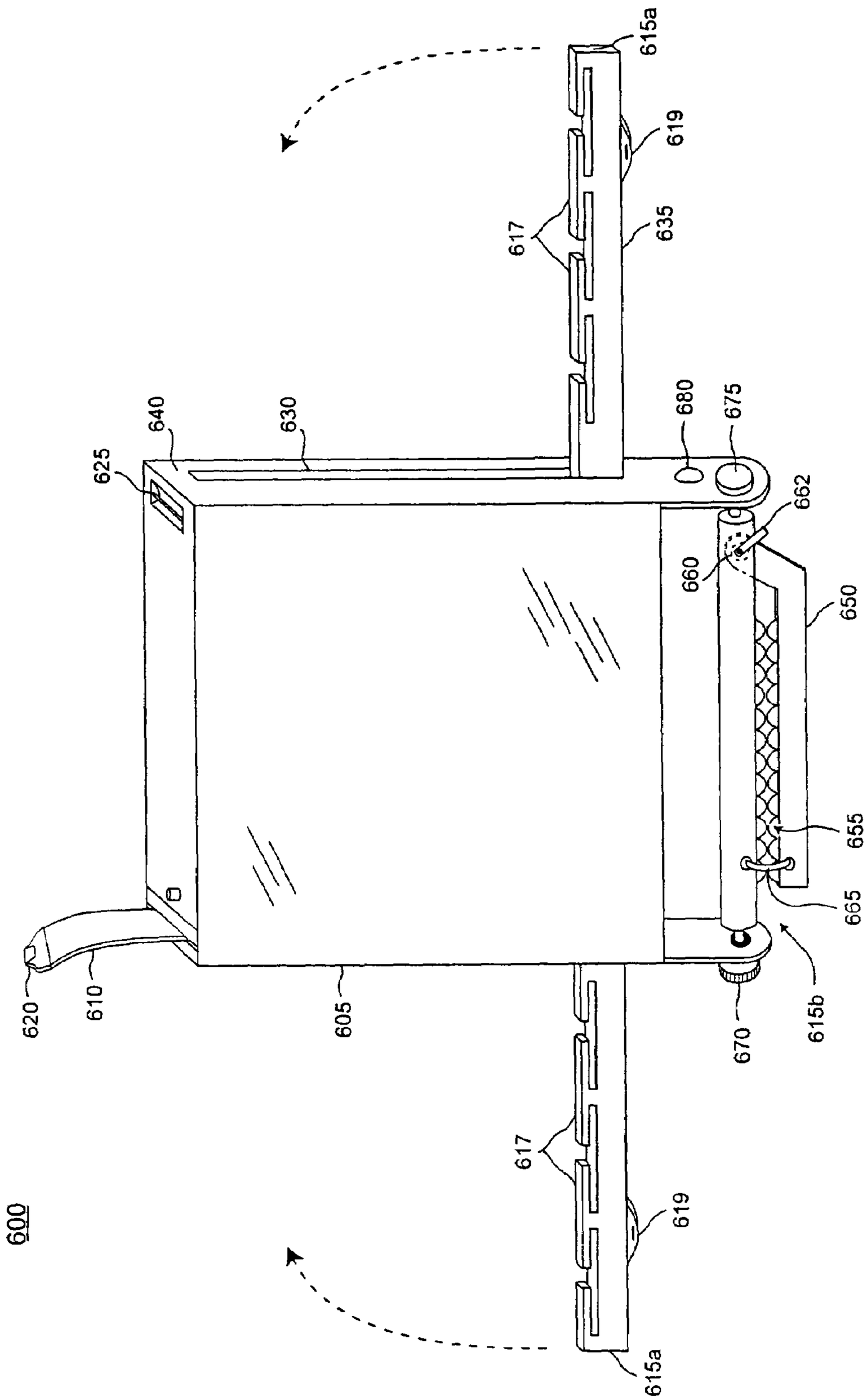
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FIG. 6A

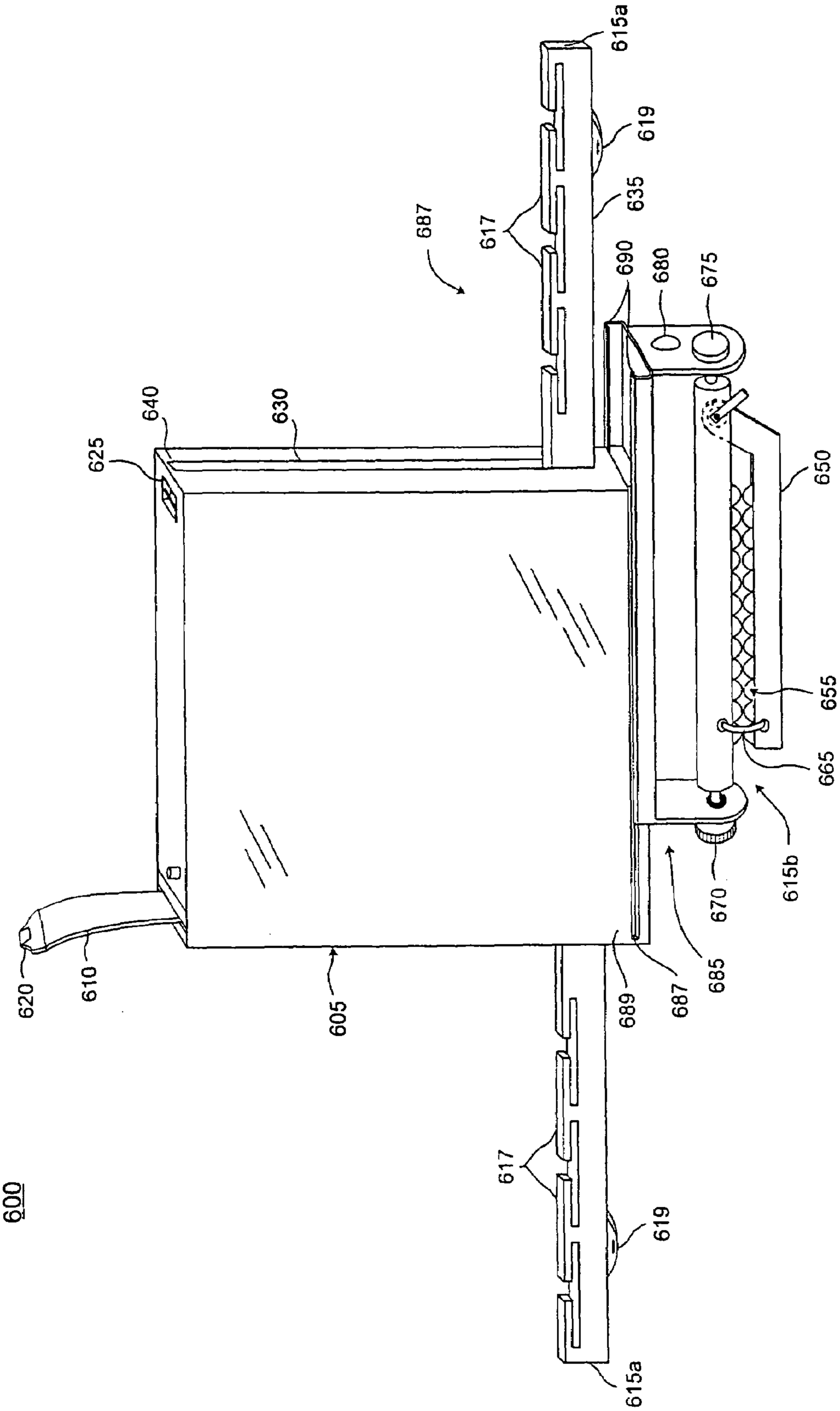
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FIG. 6B

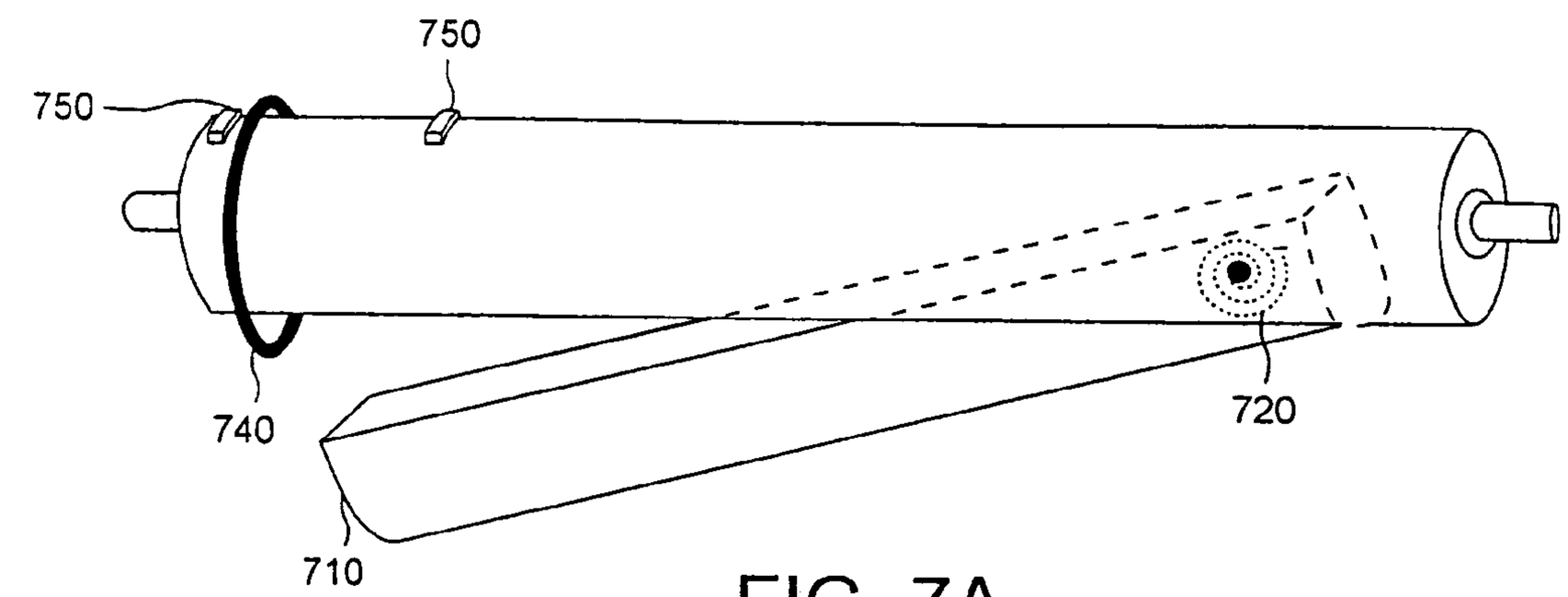


FIG. 7A

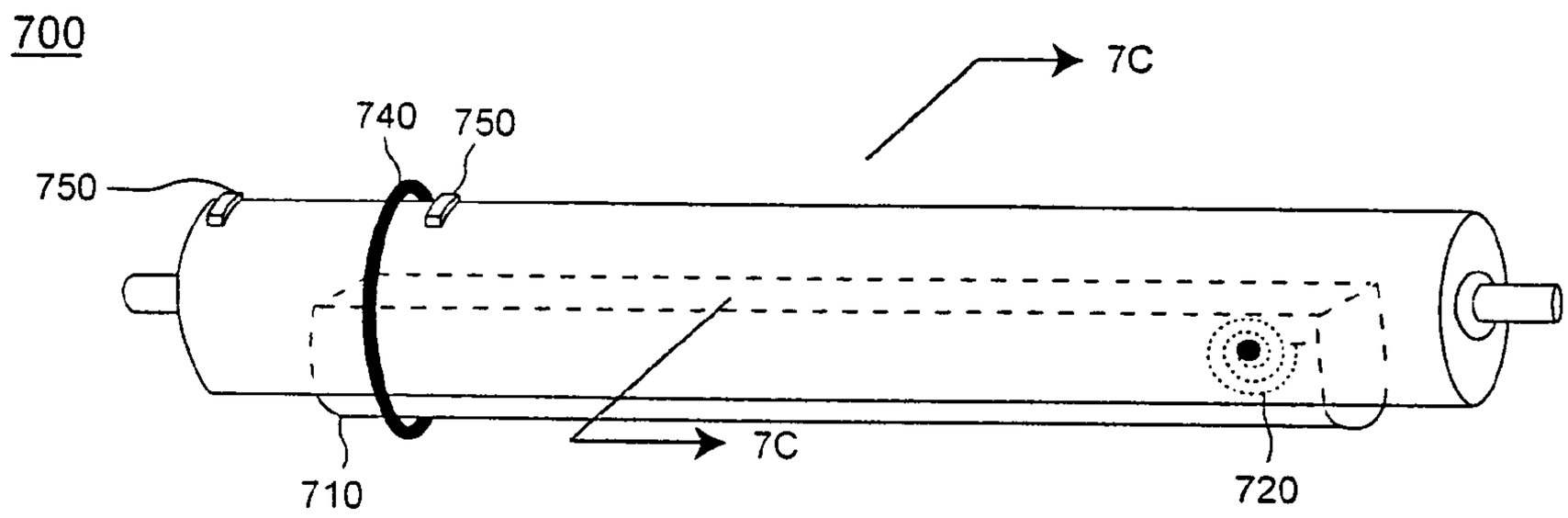


FIG. 7B

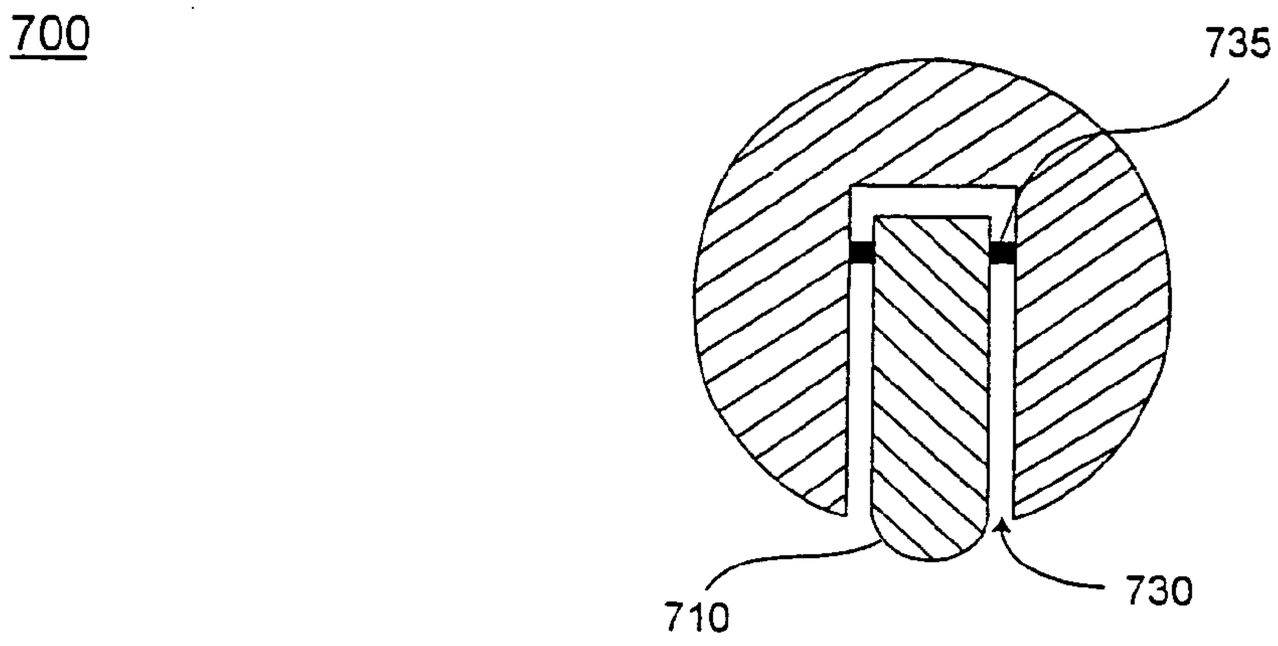


FIG. 7C

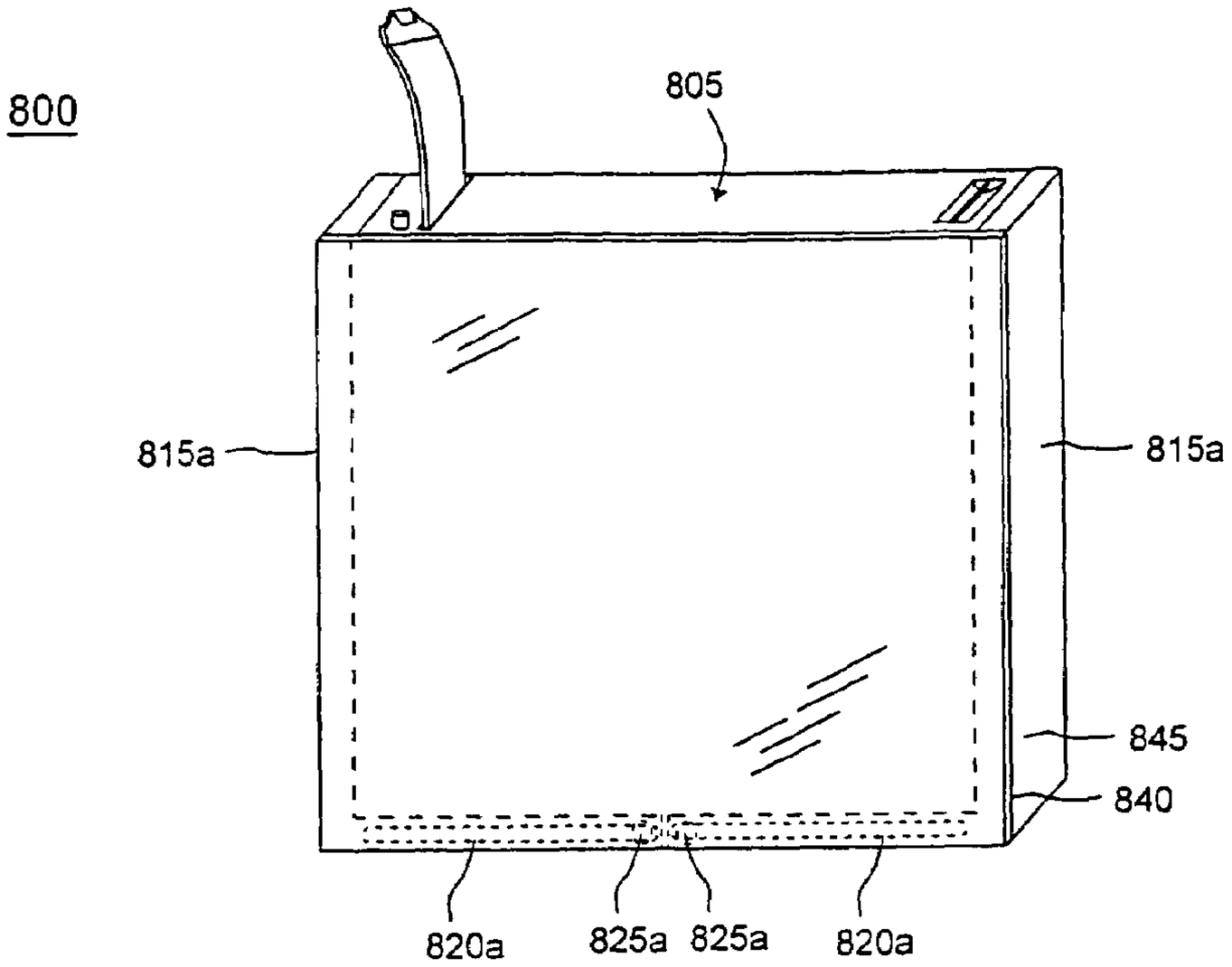
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FIG. 8A

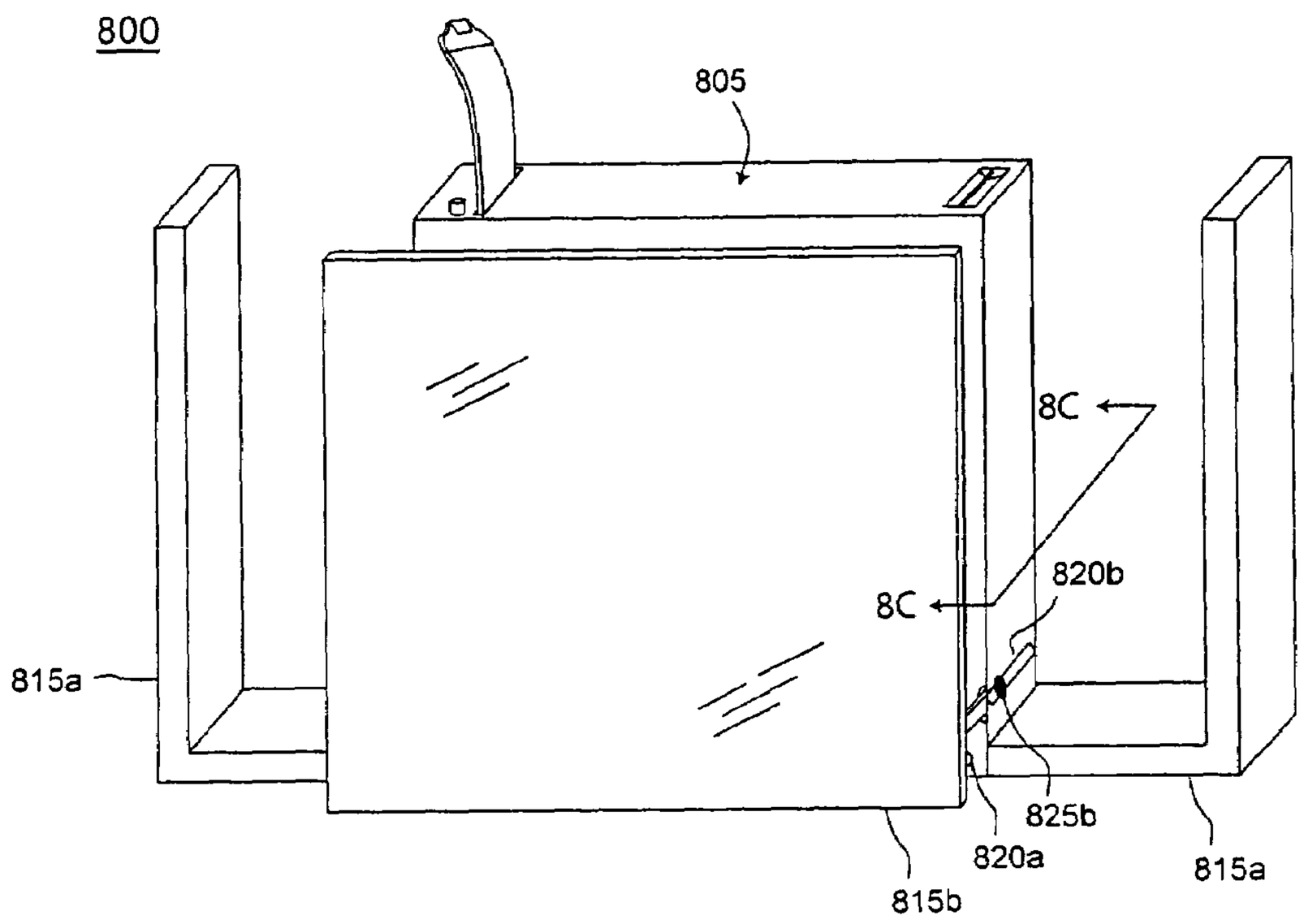
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FIG. 8B

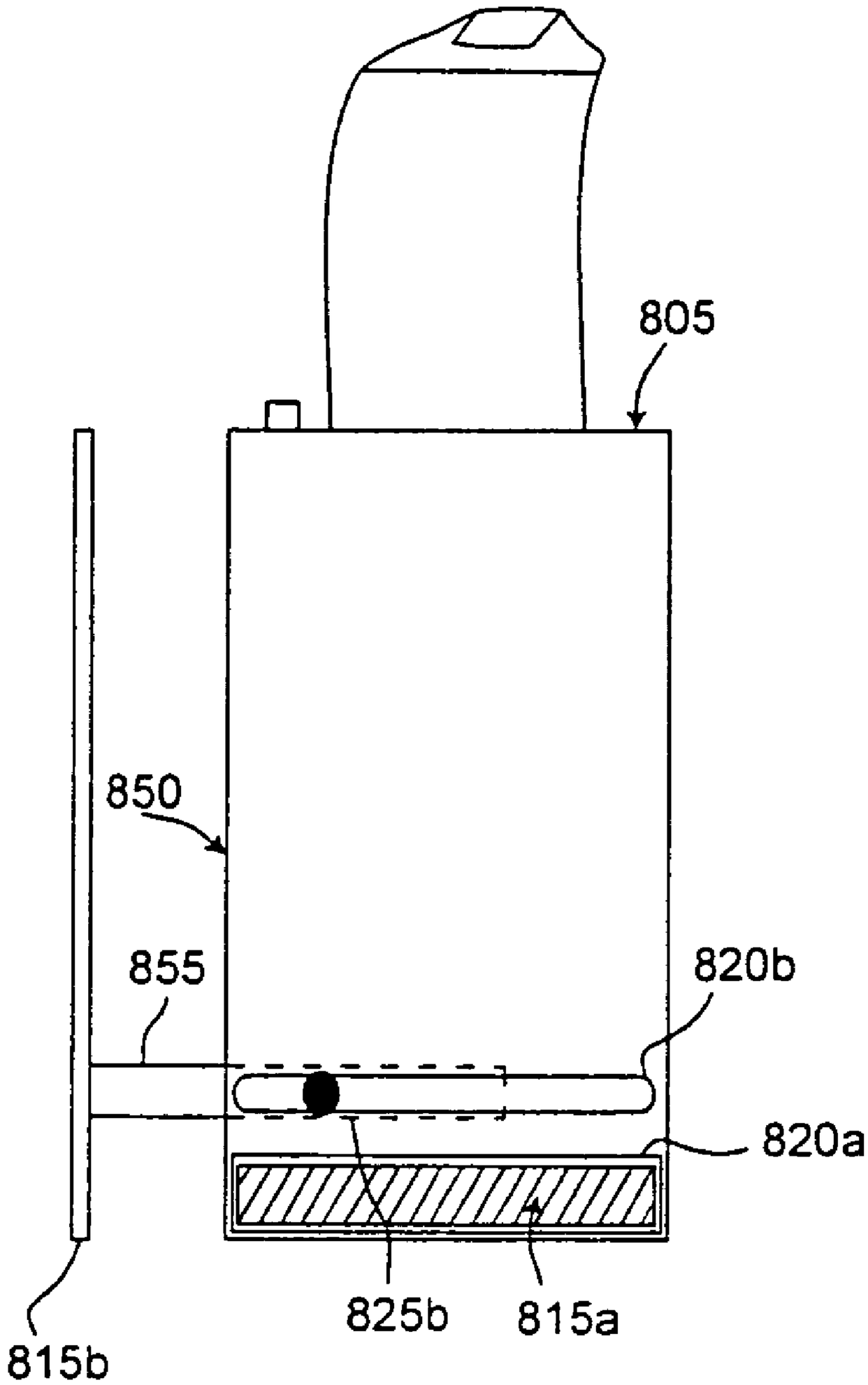


FIG. 8C

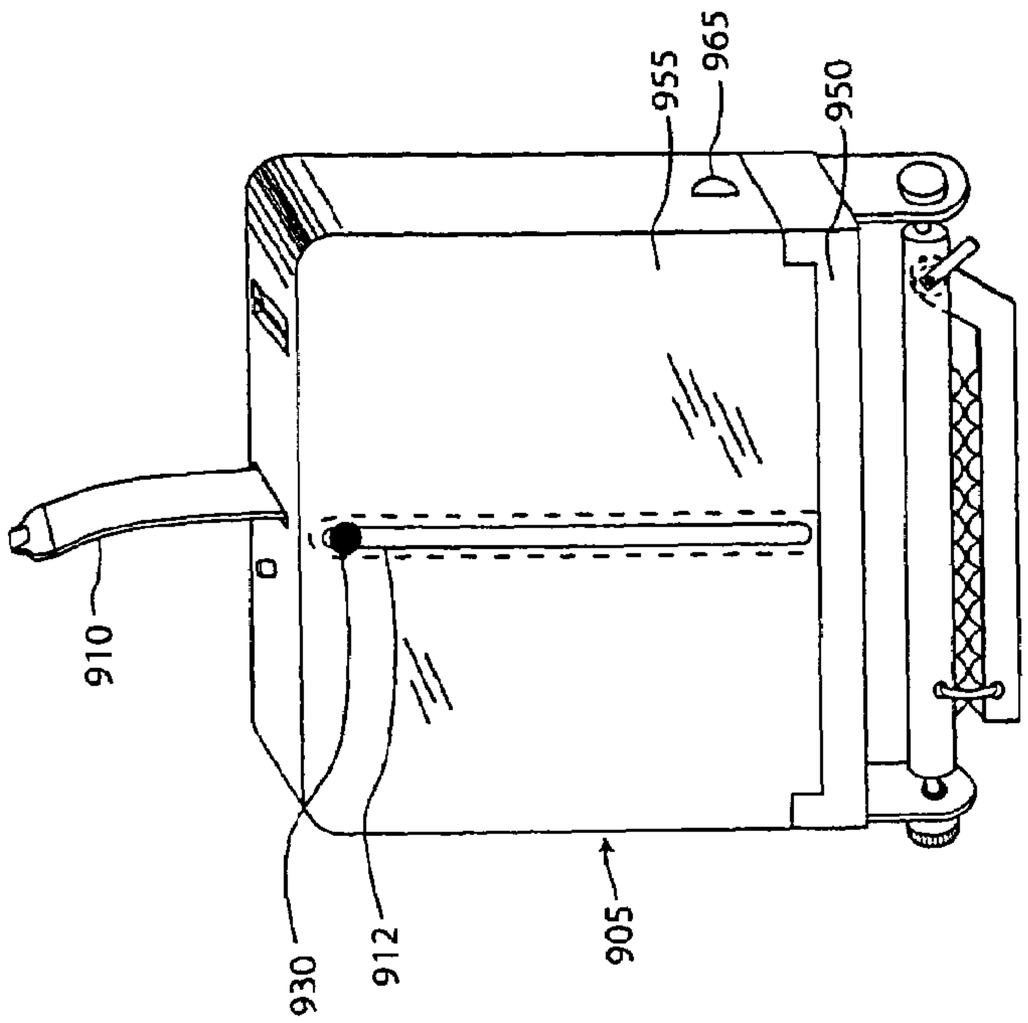
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FIG. 9B

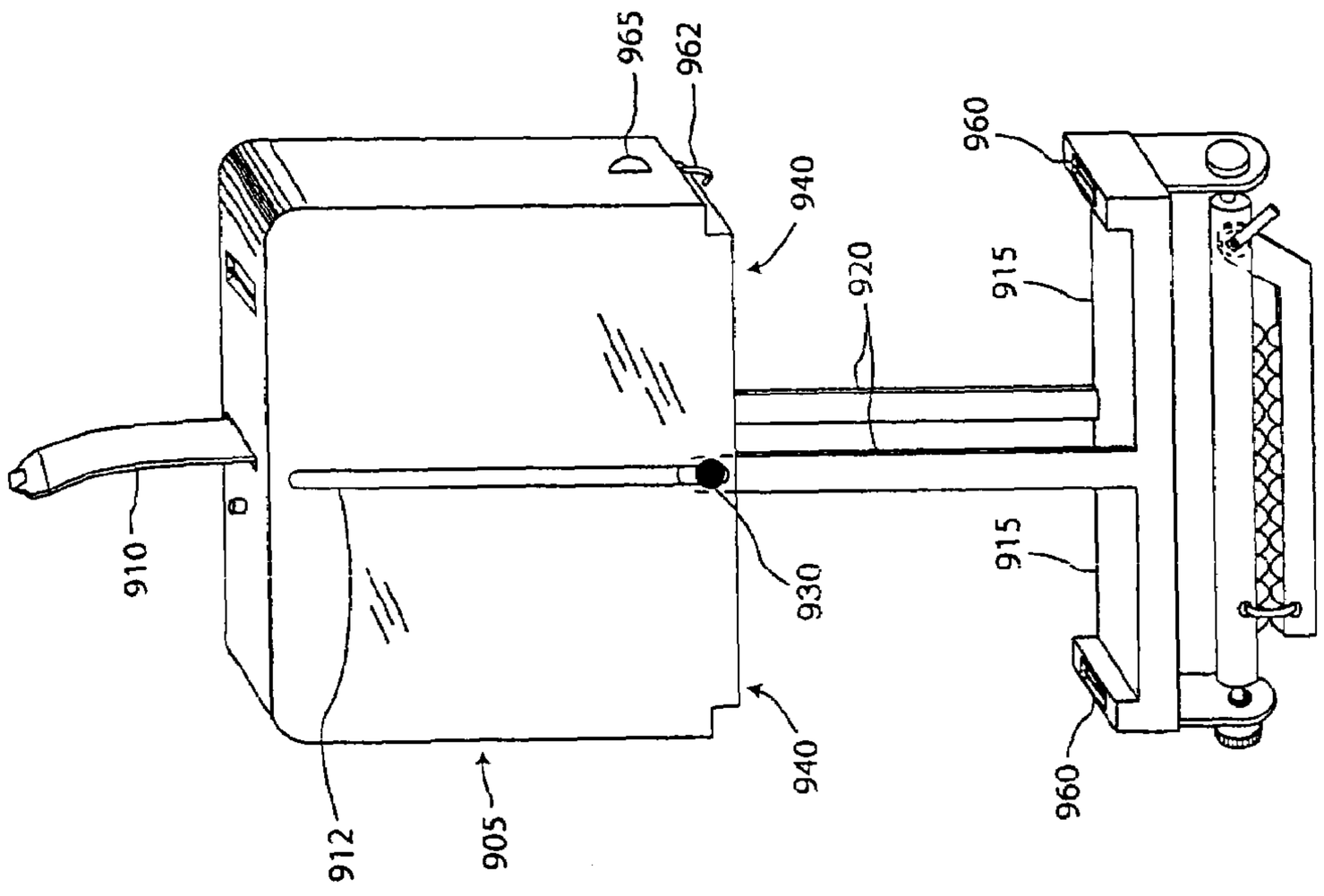
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FIG. 9A

# PORTABLE CARRYING DEVICE WITH RETRACTABLE STRAP

## BACKGROUND OF THE INVENTION

This Application is a Continuation to U.S. patent application No. 10/652,455 filed Aug. 29, 2003.

## TECHNICAL FIELD

This invention relates generally to the field of portable carrying devices, and more particularly, to compactable portable carrying devices.

## DESCRIPTION OF THE RELATED ART

Individuals commonly need to carry a variety of objects; however, there is a limit to how many objects that can be comfortably grasped with an individual's hands. To overcome this limit, many devices have been constructed to increase the number of objects that an individual can carry. Suitcases have been designed for orderly storing multiple items. However, suitcases are usually bulky and not convenient for toting along on a daily basis. As another example, backpacks allow an individual to store multiple items on the individual's back and leave the hands free for grasping other items. While back packs offer one solution, they also create another problem similar to other attempted solutions. The individual must carry the bulky backpack prior to use, and similar to suitcases, backpacks may not be convenient for toting along on a daily basis. Additionally, backpacks of any useful size cannot easily be stored as most backpacks are not configured to fold into a compact unit.

Traditional brown paper bags allow shoppers to carry multiple items, from a grocery store for example, without having to hold each item individually with the shopper's hands. Additionally, brown paper bags are easily folded into a compact state that allows easy storage. While brown paper bags can be easily stored and can ease the burden of carrying multiple items, a common disadvantage of brown paper bags is that they require a shopper to use both hands and arms to securely support the brown paper bag.

An improvement over the traditional brown paper bag is a plastic bag with integrated handles. Such plastic bags allow individuals to comfortably carry multiple items within the bag by using only the hand to grasp the handles. Plastic bags are either easily stored or simply thrown away. Nevertheless, plastic bags with handles still have limitations. For example, while a lightweight plastic bag can be easy to carry by hand, carrying a heavy plastic bag by hand can be uncomfortable and even painful. The weight of the bag can cause the bag's handles to apply a significant amount of pressure to the individual's hand. This problem is greatly exacerbated when the individual is attempting to carry multiple bags of any significant weight. The discomfort and/or pain caused by the weight of the bags only increases with the amount of time the bags must be carried. Thus, using a plastic bag to carry a heavy weight over a long period of time is not a viable option.

Additionally, while carrying heavy bags by hand may cause discomfort or pain to some individuals, other individuals simply do not have the strength to carry items by hand. For instance, many elder individuals have a decreased strength and cannot carry items that are a routine part of the life, such as shopping or grocery store bags. Further, some individuals cannot carry certain items because of a handicap or deformity. Nevertheless, such individuals in particular, need to be able to carry such items in order to remain independent from constant help. Thus, a portable device that is easily compacted for storage and that can be used to carry multiple items is desired.



## SUMMARY OF INVENTION

The present invention is directed to a portable carrying device including a housing, an elongated flexible strap extendable from the housing, and one or more rigid support arms attached to the housing and configured for supporting an article to be carried. The portable carrying device can further include a coupler disposed on a first end of the elongated flexible strap and a mating structure disposed on a portion of the housing for releasably securing the coupler.

In one embodiment, a second end of the elongated flexible strap can be secured within the housing and the rigid support arm can be movably attached to the housing. The rigid support arm can be movable from a first position in which the rigid support arm is compactly stored relative to the housing, to a second position in which the rigid support arm is at least partially extended away from the housing. The rigid support arm can be pivotally mounted to the housing or can be slidably mounted to the housing. The housing can have one or more recesses for receiving the rigid support arm and the rigid support arm can have a shape corresponding to the recess. Additionally, one or more of the outer surfaces of the rigid support arm can be substantially continuous with a housing outer surface when the rigid support arm is disposed within the recess. Thus, the rigid support arm and the housing can form a combined outer surface that is substantially free of projections.

In one embodiment, a second end of the elongated flexible strap can be secured to a retractor disposed within the housing. Further, a multitude of securing devices can be disposed along a length of the elongated flexible strap. The securing devices can be rigid hook members or can include a flexible strap material where at least a portion of the strap material is attached to the elongated flexible strap with a hook and loop fastener. Additionally, the rigid support arm can be rotatably mounted to the housing about a first axis of rotation and can have one or more clamping members configured for clamping an article to the rigid support arm. The clamping member can be pivotable about a second axis having an orientation different from the first axis. The rigid support arm can be rotatably coupled to a ratchet mechanism and the clamping member can be pivotally coupled to a ratchet mechanism.

In one embodiment, the one or more rigid support arms can be removed from the housing. Additionally, the invention can include one or more rigid support arm securing members and a belt clip. The elongated flexible strap can include a cushioning member where the cushioning member can be configured for removably attaching to the rigid support arm. Additionally, an outer surface of at least a first one of the rigid support arms can form a continuous surface with at least a second one of the rigid support arms where the outer surface is substantially free of projections when the rigid support arms are in a compact position.

In another embodiment, a portable carrying device can include a housing, and an elongated flexible strap retractably extendable from within the housing, a coupler disposed on a first end of the elongated flexible strap, a mating structure disposed on a portion of the housing for releasably securing the coupler, and one or more rigid support arms movably attached to the housing and configured for supporting an article to be carried.

In still another embodiment, the portable carrying device can include a housing, an elongated flexible strap retractably extendable from within the housing, a coupler disposed on a

first end of the elongated flexible strap, a mating structure disposed on a portion of the housing for releasably securing the coupler, and one or more rigid support arms movably attached to the housing and configured for supporting an article to be carried. The rigid support arm can be movable from a first position in which the rigid support arm is compactly stored relative to the housing, to a second position in which the rigid support arm is at least partially extended away from the housing for receiving an article to be carried.

## BRIEF DESCRIPTION OF THE DRAWINGS

There are presently shown in the drawings embodiments which are presently preferred, it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown.

FIG. **1**A is a perspective view of a first embodiment of a portable carrying device that is useful for understanding the inventive arrangements.

FIG. **1**B is a perspective view of the portable carrying device in FIG. **1**A in which the support arms are retracted.

FIG. **1**C is a perspective view of the portable carrying device in FIG. **1**B showing another side of the portable carrying device.

FIG. **2**A is a cross-sectional view of the portable carrying device in FIG. **1**B taken along lines **2**-A, with a retractor shown in a locked configuration.

FIG. **2**B is a cross-sectional view of the portable carrying device in FIG. **1**B taken along lines **2**-A, with a retractor shown in an unlocked configuration.

FIG. **3**A is a drawing that is useful for understanding how the portable carrying device in FIG. **1**A is used.

FIG. **3**B is a drawing that is useful for understanding one option of storing the portable carrying device in FIG. **1**A when not in use.

FIG. **4**A is an enlarged perspective view of a strap that can be used with the portable carrying device in FIG. **1**A.

FIG. **4**B is an enlarged perspective view showing an alternative embodiment of a strap that can be used with the portable carrying device in FIG. **1**A.

FIG. **4**C is a drawing that is useful for understanding how the strap in FIG. **4**A can be used in conjunction with the portable carrying device in FIG. **1**A.

FIG. **5**A is a perspective view of an alternative embodiment of a portable carrying device shown in a compact arrangement.

FIG. **5**B is a perspective view of the portable carrying device of FIG. **5**A shown in an extended arrangement.

FIG. **6**A is an alternative embodiment of a portable carrying device in accordance with the inventive arrangements.

FIG. **6**B is an alternative embodiment of the portable carrying device shown in FIG. **6**A.

FIG. **7**A is an enlarged perspective view showing an alternative embodiment of a rigid support member in accordance with the inventive arrangements.

FIG. **7**B is an enlarged perspective view that shows the rigid support member of FIG. **7**A with a clamping member in a clamped position.

FIG. **7**C is a cross-sectional view of the rigid support member in FIG. **7**B taken along line **7**C-**7**C.

FIG. **8**A is an alternative embodiment of a portable carrying device shown in a compact arrangement.

FIG. **8**B is a perspective view of the embodiment of FIG. **8**A shown in an extended arrangement.

FIG. **8**C is a side view of the embodiment of FIG. **8**B from the perspective of line **8**C-**8**C.

FIG. **9**A is a perspective view of an alternative embodiment of a portable carrying device shown in an extended arrangement.

FIG. **9**B is a perspective view of the embodiment of FIG. **9**A shown in a compact arrangement.

## DETAILED DESCRIPTION OF THE INVENTION

The present invention concerns a portable carrying device that can be used to carry multiple objects. In particular, the portable carrying device can be used for carrying multiple bags with handles. Advantageously, the portable carrying device can be used to carry multiple objects while leaving the user's hands free for other tasks. Additionally, the portable carrying device can transform to different configurations for use and for easy storage.

Referring to FIGS. **1**A, **1**B, and **1**C, one embodiment of the portable carrying device **100** is illustrated. The portable carrying device **100** includes a housing **105** and an elongated flexible strap **110** which is extendable from the housing **105**. The strap **110** can include cushioning member **122** that is slidably movable along the length of the strap **110**. The portable carrying device **100** also includes one or more rigid support arms **115** attached to the housing and configured for supporting an article to be carried. The housing **105** provides a base structure for connecting the portions of the portable carrying device **100**. Although the housing **105** is shown in FIGS. **1**A, **1**B, and **1**C as being substantially rectangular, one skilled in the art will recognize that the shape of the housing **105** is not limited. The shape can include other shapes, such as spherical, oval, and oblong and can even mimic the shape of a particular object, such as a cartoon character where the character's arms function as the rigid support arms **115**. Additionally, the housing **105** and the rigid support arms **115** can be constructed of a hard plastic, metal, ceramic, or any other suitable material.

The strap **110** can be disposed within the housing **105** and can be adjusted in length to be customized for the size and shape of a particular user. For example, the strap **110** can be connected to a lockable retractor located with housing **105**. The strap **110** can be constructed of any flexible material suitable for supporting objects such as a webbed material, neoprene, leather, and the like. The strap **110** includes a coupler **120** disposed on a first end of the strap **110** and a second end (not shown) secured within the housing **105**. The coupler **120** can be used to releasably secure the first end of the strap **110** to a mating structure **125** disposed on a portion of the housing **105**. The coupler **120** and mating structure **125** depicted in FIG. **1**A are simply a hook and a recess for receiving the hook that can be constructed of a hard plastic, metal or ceramic. Nevertheless, FIG. **1**A illustrates only one embodiment of a suitable combination for securing the strap **110** to the housing **105**. One skilled in the art can recognize that a variety of a combinations of a coupler **120** and a mating structure **125** can be suitably used. A non-exhaustive list of a coupler **120** and mating structure **125** includes a hook and loop fastener, a clip and buckle, hook and swivel, and the like.

The rigid support arms **115** can be movably attached to the housing **105** to allow the portable carrying device **100** to be transformed to a variety of configurations. For example, the rigid support arms **115** can be pivotally mounted to the housing **105** as shown in FIGS. **1**A, **1**B, and **1**C using any suitable pivot coupling **112**, such as hinge or an axel, to allow for smooth transitions between the first position and the second position. Nevertheless, those skilled in the art will appreciate that other configurations are also possible and the invention is not limited in this regard.

FIG. 1B depicts the rigid support arms **115** in a first position in which the rigid support arms are compactly stored relative to the housing **105**. Preferably, the housing **105** can have one or more recesses **130** for receiving the rigid support arms **115**. In the embodiment shown in FIGS. **1**A, **1**B and **1**C, the rigid support arms **115** can each have a shape corresponding to the shape of the recess **130**, thereby allowing the rigid support arms **115** to be compactly stored relative to the housing **105** in a first position.

In one embodiment as shown in FIG. **1**B, the outer surface **135** of the rigid support arm **115** can be substantially continuous with the housing outer surface **140** when the rigid support arm is disposed within recess **130**. In this compacted first position, the rigid support arms **115** and the housing **105** form a combined outer surface that is substantially free of projections. A portable carrying device **100** in a compacted first position that has a combined outer surface substantially free of projections is advantageously configured for storage in a purse, glove box, pocket, or other convenient location. Still, other arrangements of the invention can include an outer surface that has one or more projections and such arrangements are also within the scope of the invention.

As illustrated in FIG. **1**A, the rigid support arms **115** can be moved to a second position in which the rigid support arms **115** are at least partially extended away from the housing **105**. In FIG. **1**A, the rigid support arms **115** are extended approximately 90° from their compacted first position shown in FIG. **1**B. Nevertheless, the invention is not limited in this regard. For example, the rigid support arms **115** and coupling **112** can be designed to pivot 30°, 45°, 60°, 75°, 90°, 105°, or any other suitable angle, without limitation. Moving the rigid support arms **115** from the first position of FIG. **1**B to the second position of FIG. **1**A transforms the portable carrying device **100** from a compact device **100** to portable carrying device **100** ready to support multiple objects.

Turning to FIG. **1**C, the portable carrying device **100** can include an belt clip **148** for removably attaching the portable carrying device **100** to a belt or other similar structure. The invention is not limited to a belt clip **148** as any suitable structure, such as a carabiner, loop and hook fastener, and the like, can be used for removably attaching the portable carrying device to a belt, a strap, or other similar object. Additionally, it should be noted the belt clip **148** is not necessary for storing the portable carrying device **100** when not in use, as the portable carrying device **100** is preferably sized to fit in a purse, glove box, and even a pocket.

Additionally, FIG. **1**C shows the cushioning member **122** secured to the rigid support arm **115**. Preferably, the cushioning member **122** can be secured to the rigid support member **115** via hook and loop fasteners **124**, shown on the rigid support arm **115** in FIG. **1**B. Nevertheless, the invention is not limited in this regard and the cushioning member **122** can be secured to the rigid support arm **115** via any suitable structure and can also be secured to the housing **105**. Securing the cushioning member **122** to the rigid support arm **115** can prevent a portion of the strap **110** from remaining free and catching on other objects and can also prevent the rigid support arm **115** from inadvertently extending. Furthermore, it should be noted that the invention is not limited to securing the strap **110** in this regard as the strap **110** can be retracted within the housing **105** so that the coupler **120** is flush with the surface of the housing **105**.

Referring now to FIGS. **2**A and **2**B, the portable carrying device **100** can also include a retractor **145** for regulating the length of the strap **110** that is outside of the housing **105**. The retractor **145** can include teeth **165**, rotating structure **150**, biasing member **155**, and a spool (not shown). Similar to housing **105** and the rigid support arms **115**, the retractor and its components can be constructed of any suitable material, such as hard plastic, metal, ceramic, and the like.

While any suitable retractor **145** can be used, the retractor **145** illustrated in FIGS. **2**A and **2**B is arranged to have the strap **110** wrapped around and secured to the spool. The spool is mounted to at least one rotating structure **150** having a suitable biasing member **155**, such as a spiral spring, that applies a torque to the rotating structure **150**. The biasing member **155** can be arranged so that it produces a torque for rotating the spool to retrieve excess strap **110**. When the rotating structure **150** is free to rotate, the torque from the biasing member **155** causes the spool to rotate in a direction that retrieves excess strap **110** by wrapping the strap **110** around the spool.

To prevent the spool from rotating, a locking system **156** can be included. The locking system **156** can include an actuator **175** for operation by a user, a rod **170**, a lever **164** having a locking bar **160** and rotatably coupled to axel **162**, and a biasing member **166**. The connected linkage of components that form the locking system **156** is attached to the housing **105** by axel **162** and can be constructed of any suitable material such as a hard plastic, metal, or ceramic. Further, the actuator **175** can also be constructed of a hard rubber.

The rod **170** is movably coupled to the lever **164** via channel **163** disposed within the lever **164** and the locking bar **160** is rigidly fixed to one end of the lever **164**. The biasing member **166** of the locking system **156** is biased to move the locking system **156** into a locked configuration as shown in FIG. **2**A. Thus, the locking system **156** will be unlocked and allow movement of the retractor **145** only when activated by the user.

A user can unlock the retractor **145** by depressing the actuator **175**, that will cause a chain of reactions to unlock the retractor **145**. Depressing the actuator **175** will cause the rod **170** to move, forcing the lever **164** to rotate on axel **162**. In turn, the locking bar will be moved to a position where the locking bar no longer engages the teeth **165** of retractor **145**, as shown in FIG. **2**B. When the user releases the actuator **175**, the biasing member **166** will force the locking bar **160** into the locked position where the retractor **145** cannot move the rigidly affixed locking bar **160**. With the locking bar **160** moved to the locked position, the biasing member **155** of the retractor **145** is prevented from causing the spool to retract the strap **110**. Furthermore, with the locking bar **160** moved to the locked position, additional strap **110** is prevented from being released from the spool. Consequently, the locking bar **160** in the locked position maintains a constant length of strap **110** that is outside of the housing **105**.

In order to change the length of the strap **110** that is outside the housing **105**, i.e. to either retrieve excess strap **110** or release additional strap **110**, a user can depress the actuator **175** to move the locking bar **160** from the locked position. With the locking bar **160** in the unlocked position, the rotating structure **150** can rotate in either direction. Torque produced by the retractor biasing member **155** can rotate the spool and wind up portions of strap **110** that have been pulled out of the housing **105**. Alternatively, with the locking bar **160** in the unlocked position and the spool able to rotate, a user can retrieve additional strap **110** to lengthen the amount of strap **110** that is outside of the housing **105**. Thus, the retractor **145** allows a user to adjust the length of the strap **110** by depressing the actuator **175** and manually pulling on the strap **110** or allowing excess strap **110** to be retrieved by the retractor **145**.

Those skilled in the art will appreciate that the retractor **145** and locking system **156** shown in FIGS. **2**A and **2**B are intended as merely one possible example of a retractor

mechanism with corresponding locking mechanism. Retractor mechanisms with locking mechanism are well known in the art and any suitable strap retractor system with a locking mechanism can be used. For example, instead of a spring biased retractor, a hand cranked retractor mechanism could be used. Similarly, the locking arrangement shown is merely one possible example of a locking mechanism that can be used with the invention. Other locking mechanisms are also acceptable. For example, a simple friction pad could also be engaged against rotating structure **150** to lock the strap **110** in place.

Turning to FIG. **3**A, a portable carrying device **100** is shown in use. The portable carrying device **100** is illustrated with the strap **110** extended over and around the user's shoulder. Additionally, two bags **180** are shown supported by the rigid support arms **115**. Thus, the entire weight of the portable carrying device **100** and the bags **180** is supported by the user's shoulder, allowing the user to comfortably carry the bags **180** while having the hands free to grasp other objects.

It should be noted that the invention is not limited to the particular arrangement as shown in FIG. **3**A. For instance, excess strap, if needed, can be retrieved from the housing **105** to allow the user to place the strap **110** around the user's chest. Furthermore, the portable carrying device **100** is not limited in the number of bags **180** or other articles that can be supported by the rigid support arms **115**.

Further, in FIG. **3**B the portable carrying device **100** is shown while not in use as being attached to the user's belt. The belt clip (shown in FIG. **1**C) allows the portable carrying device **100** to be removably attached to the user's belt, and thus can be carried while not in use without inconvenience to the user. In such an arrangement, the portable carrying device **100** can be carried by the user on a daily basis for use whenever needed.

One embodiment of a strap **410** that can be used with portable carrying device **100** is illustrated in FIGS. **4**A-**4**C. FIGS. **4**A and **4**B depict multiple securing devices **485** disposed along the length of the strap **410**. In FIG. **4**A, the multiple securing devices **485** are rigid hook members **486**. The rigid hook members **486** can be constructed of any suitable material such as plastic, metal, ceramic and the like. The rigid hook members **486** can be used to support articles and are particularly well suited for supporting bag handles, such as plastic bag handles.

In FIG. **4**B, the multiple securing devices **485** include a flexible material **487**, of which one end is coupled, for example by stitching, to the strap **410**. The opposite end of the flexible material **487** can be provided with a hook and loop fastener **489** that can allow the strap material **487** to be releasably coupled to the strap **410**. Similar to the rigid hook members **486**, the flexible material **487** can support articles such as bags with handles. Nevertheless, the flexible material **487** is particularly well suited for supporting other objects without handles that can be secured by the flexible material **487**, such as pens, keys, and the like. Accordingly, the invention is not limited to a strap that includes securing devices.

FIG. **4**C depicts a portable carrying device **100** with strap **410** that is supporting multiple bags **180**. In addition to the bags **180** being supported by rigid support arms **115**, a bag **180** is also being supported by a securing device **485**. In this particular embodiment, the securing device **485** is a rigid hook member **486**; nevertheless, the invention is not limited in this regard as a flexible material **487** with a hook and loop faster can also be used. Furthermore, the strap **410** can include multiple securing devices **485** located along the length of the strap **410**. Additionally, the securing devices **485** located along the strap **410** can include a combination of hook members **486** and flexible material **487** with a hook and loop fastener **489**.

An alternative embodiment of a portable carrying device is shown in FIGS. **5**A and **5**B. A portable carrying device **500** can have a housing **505** with one or more recesses **508** for receiving rigid support arms **515** that have a shape generally corresponding to the shape of the recess **508**. Similar to other embodiments, the housing **505** and rigid support arms **515** can be constructed of a hard plastic, metal, ceramic, and the like.

In FIG. **5**A, the rigid support arms **515** are in a compacted position and are firmly secured within the recess **508** of housing **505**. The rigid support arms **515** can be secured in the compacted position with a rigid support arm securing member **512**. In one arrangement as shown in FIG. **5**B, the rigid support arm securing member **512** can include a detent ball **512** constructed of a metal, plastic, or ceramic and located on the rigid support arms **515**. The detent ball **512** can be biased to extend outward from the rigid support arms **515**, but can be depressed to not protrude beyond the outer surface **535** of the rigid support arms **515**. In operation, with biased detent ball **512** depressed, the rigid support arms **515** can slide into the housing **505**. At a location within the housing **105**, the detent ball **512** can extend into a corresponding detent (not show) to secure the rigid support arms **515** in the compacted position. The rigid support arms **515** can be slid to the extended position by pulling on the rigid support arms **515** with sufficient force to overcome the bias of the detent ball **512**.

Nevertheless, it should be noted that the rigid support arms **515** can be secured within the housing **505** and in a compacted position with other rigid support arm securing members as is known in the arts. In one example of such a locking arrangement (not shown), the rigid support arms **515** can be secured in a compacted position using locking structures located within the housing **505** and having controls on the outside of the housing **505**. Notably, when the device **500** is in its compacted configuration, the housing outer surface **540** and the rigid support arm outer surface **535** can form a surface that is substantially free of projections.

The rigid support arms **515** can be slidably mounted within or on a portion of the housing **505**. While FIGS. **5**A and **5**B show the rigid support arms **515** slidably mounted within channels **550**, the invention is not limited in this regard as any suitable slidable mount, such as a tongue and a groove, can be used. The portable carrying device **500** can be transformed from a compacted configuration, as shown in FIG. **5**A, to an extended configuration, as shown in FIG. **5**B by sliding the rigid support arms **515** from a compacted position to an extended position.

In the extended position, articles can be hung or placed on the rigid support arms **515**. For example, bag handles can be slid through gap **560** between the two rigid support arms **515** and draped around each respective rigid support arm **515**. Additionally, although the rigid support arms **515** are slidably mounted within channels **550**, the rigid support arms **515** can pivot slightly to increase size of the gap **560** and allow for larger objects to be draped around the rigid support arms **515**. When the portable carrying device **500** is not in use, the rigid support arms **515** can be returned to the compacted position for storage.

Another embodiment of a portable carrying device is illustrated in FIG. **6**A. The portable carrying device **600** includes a strap **610**, a coupler **620** and corresponding mating structure **625** located on housing **605**. The portable carrying device **600** also includes rigid support arms **615***a* for supporting one or more objects. Notably, the rigid support arms **615***a* include

notched structures **617** that can be used to separate the handles of bags to be carried. Such notched structures **617** allow the supported articles to be strategically placed on the support arms **615***a* to achieve a balanced load. Similar to the other embodiments of a portable carrying device, the components of portable carrying device **600** can be constructed of any suitable materials as discussed previously.

The rigid support arms **615***a* can be movably coupled on the interior of the housing **605** via a coupling, such as an axel, hinge, pivot, and the like. The rigid support arms **615***a* can be moved into recess **630** to allow the rigid support arms **615***a* to be moved to a compact position, as shown by the dotted arrows. The rigid support arms **615***a* can be disposed in recess **630** as the rigid support arm **615***a* has a corresponding shape to recess **630**. When the rigid support arm **615***a* is disposed in recess **630**, the outer surface **635** of the rigid support arm **615***a* can be substantially continuous with the housing **605** outer surface **640**. In such a configuration, the rigid support arm **615***a* and the housing **605** form a combined outer surface that is substantially free of projections. Additionally, the rigid support arms **615***a* can include a tab **619** for gripping when the rigid support arms **615***a* are disposed within the recess **630**.

FIG. **6**A also illustrates another rigid support arm **615***b* that is rotatably mounted to the housing **605** about a first axis of rotation and can be constructed of a hard plastic, metal, ceramic, and the like. The rigid support arm **615***b* includes at least one clamping member **650** configured for clamping an article to the rigid support arm **615***b*. The clamping member **650** can be pivotally coupled to the rigid support arm **615***b* about a second axis of rotation having a different orientation from the first axis rotation, as shown. Additionally, the clamping member **650** can be coupled to the rigid support arm **615***b* with a ratchet mechanism **660** having a release **662**. As is known in the arts, a ratchet mechanism can allow rotation in one direction while preventing rotation in the opposite direction. In operation, the ratchet mechanism's release **662** can be moved to allow the clamping member **650** to be opened to allow bag handles to be draped over the clamping member **650**. The release **662** can be moved again to pivot the clamping member **650** to a clamped position, as shown in FIG. **6**A. In this position, the ratchet mechanism **660** can prevent the clamping member **650** from opening, even when heavy objects are hung from the clamping member **650**.

It should be noted that the invention is not limited to having a ratchet mechanism **660** for controlling the pivoting of the clamping member **650**. For instance, a spiral spring (not shown) can be located on the axis of coupling the clamping member **650** to the rigid support arm **615***b* and can produce a torque in the direction of pivoting the clamping member **650** to a clamped position. The tension provided by the spiral spring is preferably sufficient to pivot the clamping member **650** to a clamped position while still allowing a user to pivot the clamping member **650** to an open position for the introduction of articles to carry. Still, the spiral spring and the ratchet mechanism **660** are not essential and the invention is not limited in this regard.

The rigid support arm **615***b* can also include ridges **655** for separating articles to be carried and a locking member **665** for locking the clamping member **650** to the rigid support arm **615***b*. The ridges **655** can be formed of the same material as the support arm **615***b* or can be formed as a hard rubber for improved gripping. In operation, a user can place an article, preferably the handle of an article, on the clamping member **650** and pivot the clamping member **650** to the clamped position. The user can then rotate the rigid support arm **615***b* by applying a torque to the handle **670** in the direction of desired rotation. Rotating the rigid support arm **615***b* will cause the article to become progressively wrapped around the rigid support arm **615***b* to ensure a secure arrangement for carrying. An advantage of this feature is that a user is not required to manipulate loop handles of cloth or plastic bags. Instead, a user can simply drape the top of the bag on the clamping member and rotate the rigid support arm **615***b* until the bag is secured.

Additionally, a ratchet mechanism **675** can be included in housing **605** at the junction of rotatably coupling the rigid support arm **615***b* to the housing **605**. As is known in the arts, the ratchet mechanism **675** can allow rotation of the rigid support arm **615***b* in one direction and prevent rotation in the opposite direction. Thus, once an article has been progressively wrapped around the rigid support arm **615***b*, the ratchet mechanism **675** can prevent unintentional unwrapping of the article. The ratchet mechanism **675** not only cooperates with the rigid support arm **615***b* to provide a stable structure for carrying an article, the ratchet mechanism **675** also provides a security feature that prevents an article from being unknowingly removed from the rigid support arm **615***b*. The ratchet mechanism **675** can be operated by a control device, such as button **680**, that can be depressed to change the direction of ratcheted rotation of the rigid support arm **615***b*.

FIG. **6**B shows another embodiment of the portable carrying device **600**. In this embodiment, the rigid support arm **615***b* can be coupled to a removable mounting structure **685** that can allow the rigid support arm **615***b* to be removed from housing **605**. Any suitable coupling arrangement can be used for this purpose. For example, one or more grooves **687** can be disposed within one or more faces **689** of the housing **605** for accepting one or more rails **690** of the removable mounting structure **685**. Preferably, the housing **605** can have two grooves **687** disposed in opposing faces of the housing **605** and the removable mounting structure **685** can have two rails **690** for sliding along the grooves **687**.

To ensure that the removable mounting structure **685** is secured to the housing **605** and cannot be inadvertently removed from the housing **605**, the length of the grooves **687** and the corresponding rails **690** can be slightly shorter than the length of the housing face **689**. In such an arrangement, the removable mounting structure **685** can be removed from the grooves **687** by sliding the removable mounting structure **685** out of the grooves **687**.

The removable mounting structure **685** can be constructed of a hard plastic, rubber, and/or metal that can allow for slight bending without deformation. Additionally, its should be noted that the removable mounting structure **685** can be mounted to the housing **605** in a variety of other arrangements that are known in the art. For example, the removable mounting structure **685** can be mounted to the housing **605** with bolt and nut fasteners, clips, and other suitable structures that provide for a removable mounting.

In another embodiment, rigid support arm **700** is shown in FIGS. **7**A-**7**C. The rigid support arm **700** is shown separate from a housing, but those skilled in the art will readily understand the rigid support arm **700** can be rotatably mounted to a suitable portable carrying device in a manner similar to the mounting of rigid support arm **615***b*, as shown in FIG. **6**A. As also similar to the rigid support arm **615***b*, the rigid support arm **700** can be formed of a suitable hard plastic, metal, ceramic, and the like.

The rigid support arm **700** can include a clamping member **710** that is pivotally coupled to the rigid support arm **700** and a spiral spring **720** mounted at the point of coupling. The spiral spring **720** can produce a torque in the direction of pivoting the clamping member **710** to a clamped position, as

shown in FIG. **7**B. The clamping member **710** can also be pivoted to an open position as shown in FIG. **7**A.

Turning to FIG. **7**C, a cross-section taken along lines **7**C-**7**C of the rigid support arm **700** is shown. This perspective shows that a substantial portion of the clamping member **710** is disposed within an elongated cavity **730** of the rigid support arm **700** when in clamped position. Nevertheless, this perspective also illustrates that there is unoccupied space for a bag handle to be clamped therein. Additionally, an axel **735** is shown as the movable coupling; however, the invention is not limited in this regard as any suitable movable coupling, such as a ratcheted coupling, can be used.

As an additional form of security, a ring member **740** can be included with the rigid support arm **700**. The ring member **740** can slide along a portion of the rigid support arm **700** and is prevented from being removed from the rigid support arm **700** by raised structures **750**. The ring member **740** can be positioned to allow the clamping member **710** to pivot to an open position as shown in FIG. **7**A. As shown in FIG. **7**B, the ring member **740** can be positioned to lock the clamping member **710** in clamped position and prevent unintentional opening of the clamping member **710**. Additionally, the ring member **740** can be formed of any suitable material, such as a hard plastic, metal, ceramic, rubber, and the like.

Another embodiment of the portable carrying device is shown in FIG. **8**A and FIG. **8**B. Similar to the other embodiments discussed above, the portable carrying device **800** can include a strap coupled to a retractor. In another similarity to the other embodiments of the portable carrying device, the housing **805** and the rigid support arms **815***a* and **815***b* can be constructed of a hard plastic, metal, ceramic, and the like. The portable carrying device **800** is shown in FIG. **8**A in a compacted configuration and shown in FIG. **8**B in an extended configuration.

In FIG. **8**A, dotted lines are used to illustrate channels **820** in which rigid support arms **815***a* are slidably mounted. The rigid support arms **815***a* are secured to the channels **820***a* via an end member **825***a* that has dimensions slightly larger than the dimensions of the channel **820***a* so that the rigid support arms **815***a* cannot be inadvertently removed from the channel **820***a*. In FIG. **8**B, the rigid support arms **815***a* have been slid along channels **820***a* to an extended position that is suitable for carrying multiple objects. Rigid support arm **815***b* is also shown in an extended position. Similar to the channels **820***a* in which rigid support arms **815***a* are slidably mounted, rigid support arm **815***b* can also be slidably mounted in channels **820***b* and secured with end member **825***b*.

FIG. **8**C shows a side view of FIG. **8**B taken from a perspective of line **8**C-**8**C and illustrates a portion of rigid support arm **815***a* in cross-section and rigid support arm **815***b* in an extended position. Rigid support arm **815***b* is shown with extension member **855** slidably mounted in channel **820***b* and partially extended from housing **805**. The remaining portion of extension member **855** is shown with dotted lines to indicate its position along channel **820***b* within the housing **805**. The channel **820***b* is shown above channel **820***a*; however, the invention is not limited in this regard as the placement of the channel **820***a* and **820***b* can be alternated without changing the operation of the portable carrying device **800**. Further it should be noted that the dimensions of rigid support arm **815***b* correspond to the dimensions of surface **850** of housing **805** so that the rigid support arm **815***b* and housing **805** for a continuous surface that is substantially free of projections in the compact configuration.

The rigid support arms **815***a* and **815***b* can be used independently of each other and in different combinations. For example, a user can carry multiple objects with only rigid support arm **815***b*. Alternatively, a user may desire to carry multiple objects utilizing all the rigid support arms simultaneously. Thus, the use of portable carrying device **800** is not limited to any particular arrangement. Furthermore, it should be noted that the number of rigid support arms **815***a* and **815***b* is not limited as the invention is considered to cover multiple arrangements. For example, a rigid support arm can be included on the opposite side of the housing **805** from rigid support arm **815***b*. Additionally, rigid support arms **815***a* and **815***b* can also include multiple rigid support arms along side of the housing **805** instead of the single rigid support arms shown.

Returning to FIG. **8**A, the portable carrying device **800** is shown in a compacted configuration where the rigid support arms **815***a* and **815***b* meet to form an outer continuous surface that is substantially free of projections. FIG. **8**A illustrates that the rigid support arm **815***b* is slightly wider than the width of the housing **805** so that the edge **840** of rigid support arm **815***b* is inline with the surface **845** of rigid support arm **815***a* to form the continuous surface that is substantially free of projections. Nevertheless, the invention is not limited in this regard as the rigid support arm **815***b* can be the same shape and dimensions as the shape and dimensions of the housing **805**. Thus, the rigid support arm can provide a face of the housing **805** that can be extended to be used as rigid support arm **815***b*.

Another embodiment of the portable carrying device **900** is shown in FIG. **9**A and FIG. **9**B. FIG. **9**A illustrates the portable carrying device **900** with rigid support arms **915** in an extended position that can be used for carrying objects; FIG. **9**B illustrates the portable carrying device **900** with rigid support arms **915** in a compacted position that can be advantageous for storing the portable carrying device **900**.

Portable carrying device **900** can include one or more channels **912** for slidably mounting extension members **920** to the housing **905**. The extension members **920** can be secured to the channels **912** via an end member **930** that has dimensions slightly larger than the dimensions of the channel **912** so that the extension members **920** cannot be inadvertently removed from the channel **912**. The end member **930** can be configured to be removed to allow the extension members **920** and the rigid support arms **915** to be removed from the housing **905** for maintenance and other purposes. Additionally, the end member **930** can include a rough outer surface, such as multiple ridges, that can be used for gripping by a user.

The portable carrying device **900** can also include a retractor (not shown) for regulating the length of the strap **910**. One skilled in the art will readily understand that, in this arrangement, the retractor can be located slightly to one side of channels **912** so as to not interfere with the operation of the channels **912** or the operation of the retractor. Furthermore, one skilled in the art would readily understand that the channels **912** can be displaced from a central area of the housing **905** without materially altering the operation of the portable carrying device **900**. Thus, the invention is not limited with regard to the placement of the retractor or the placement of the channels **912**.

In this arrangement, the housing **905** can have one or more recesses **940** for receiving the rigid support arms **915**. The rigid support arms **915** can have a shape that corresponds to the shape of the recess **940**. Thus, when the rigid support arms **915** are in the compacted configuration, the outer surface **950** of the rigid support arms **915** can be substantially continuous with the housing outer surface **955** to form a combined outer surface that is substantially free of projections.

Furthermore, the rigid support arms **915** can be secured to the housing **905** by internal rigid support arm securing members **962** that hook to one or more lock structures **960**. The internal rigid support arm securing members **962** can be operated by depressing one or more buttons **965** and causing the rigid support arm securing members **962** to pivot, thereby releasing the lock structures **960**. When released, the rigid support arms **915** can be moved from the compacted configuration of FIG. **9**B to the extended configuration of **9**A. Additionally, the internal rigid support arm securing members **962** can be biased to a pivot to a hook position, thereby hooking the lock structures **960** when the rigid support arms **915** are slid to the compacted configuration. It should be noted that the invention is not limited in this regard as the rigid support arms can be secured the housing **905** in a variety of other arrangements that are known in the art.

While the preferred embodiments of the invention have been illustrated and described, it will be clear that the invention is not so limited. Numerous modifications, changes, variations, substitutions and equivalents will occur to those skilled in the art without departing from the spirit and scope of the present invention as described in the claims.

We claim:

**1**. A portable carrying device, comprising:

a housing sized to fit in a pocket;

an elongated flexible strap retractably extendable from an upper portion of said housing and having two opposing ends;

at least two rigid support arms configured to be movably extendable to rigidly project from a lower portion of said housing opposed from said upper portion when in a first position, and returned to a second position in which said rigid support arms are not extended from said housing, at least a portion of each of said at least two rigid support arms having a curved section extending generally toward said upper portion of said housing when said rigid support arms are in said first position;

a coupler disposed on a first one of said two opposing ends of said elongated flexible strap;

a retractor disposed within said housing and secured to a second one of said two opposing ends of said elongated flexible strap; and

a mating structure disposed on said upper portion of said housing configured for releasably securing said coupler to said housing;

wherein one or more bags can be removably carried on said two rigid support arms when in said first position, and said flexible strap is extended around a user's shoulder.

**2**. The portable carrying device according to claim **1**, wherein said curved section of said at least two rigid support arms defines a contour which conforms to an exterior surface of said housing.

**3**. The portable carrying device according to claim **1**, wherein said at least two rigid support arms are pivotally mounted to said lower portion of said housing.

**4**. The portable carrying device according to claim **1**, wherein said housing has at least two recesses configured for respectively receiving said at least two rigid support arms.

**5**. The portable carrying device according to claim **4**, wherein said curved section of said at least two rigid support arms have a shape corresponding to said at least two recesses.

**6**. The portable carrying device according to claim **5**, wherein at least one outer surface of said rigid support arm is substantially continuous with a housing outer surface when said rigid support arm is disposed within said recess, whereby said rigid support arm and said housing form a combined outer surface that is substantially free of projections.

**7**. The portable carrying device according to claim **1**, wherein said elongated flexible strap includes a cushioning member.

**8**. The portable carrying device according to claim **1**, further comprising a belt clip.

**9**. A portable carrying device, comprising:

a housing;

an elongated flexible strap retractably extendable from said housing and having two opposing ends;

at least two rigid support arms attached to said housing, each of said rigid support arms configured for supporting an article to be carried thereon;

a coupler disposed on a first one of said two opposing ends of said elongated flexible strap;

a retractor disposed within said housing and secured to a second one of said two opposing ends of said elongated flexible strap; and

a mating structure disposed on a portion of said housing configured for releasably securing said coupler;

wherein an outer surface of at least a first one of said at least two rigid support arms forms a continuous surface with an outer surface of at least a second one of said at least two rigid support arms, said continuous surface free of projections when each of said first and second one of said at least two rigid support arms is in a compact position.

**10**. A portable carrying device, comprising:

a housing sized to fit within a pocket, said housing having at least two recesses configured for receiving at least two rigid support arms configured to be movably extendable to rigidly project from a lower portion of said housing opposed from said upper portion when in a first position, and returned to a second position in which said rigid support arms are not extended from said housing, at least a portion of each of said rigid support arms having a curved section extending generally toward an upper of said housing when said rigid support arms are in said first position, each of said rigid support arms having a shape conforming to a respective recess of said at least two recesses;

an elongated flexible strap retractably extendable from an upper portion of said housing;

a coupler disposed on a first end of said elongated flexible strap;

a mating structure disposed on said upper portion of said housing and configured for releasably securing said coupler to said housing;

wherein outer surfaces of said at least two rigid support arms are substantially continuous with an outer surface of said housing when said at least two rigid support arms are disposed within said at least two recesses, whereby said outer surfaces of said at least two rigid support arms and said outer surface of said housing form a combined outer surface of said portable carrying device that is free of projections.

**11**. A portable carrying device, comprising:

a housing sized to fit within a packet, said housing having at least two recesses having L-shapes, each recess of said at least two recesses is configured for receiving a rigid support arm of at least two rigid support arms having L-shapes corresponding to said at least two recesses, each rigid support arm of said at least two rigid support arms movably attached to said housing and configured for supporting and securing an article to be carried thereon;

an elongated flexible strap retractably extendable from within said housing and having two opposing ends;

a coupler disposed on a first one of said two opposing ends of said elongated flexible strap;

a retractor disposed within said housing and secured to a second one of said two opposing ends of said elongated flexible strap; and

a mating structure disposed on a portion of said housing and configured for releasably securing said coupler to said housing;

wherein (a) each rigid support arm of said at least two rigid support arms is movable from a first position in which said rigid support arm is compactly stored relative to said housing to a second position in which said rigid support arm is at least partially extended away from said housing and configured for receiving an article to be carried thereon, and (b) outer surfaces of said at least two rigid support arms form a substantially continuous surface with an outer surface of said housing when said at least two rigid support arms are in compact positions, said outer surfaces of said at least two rigid support arms and said outer surface of said housing form a combined outer surface of said portable carrying device that is free of projections.

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